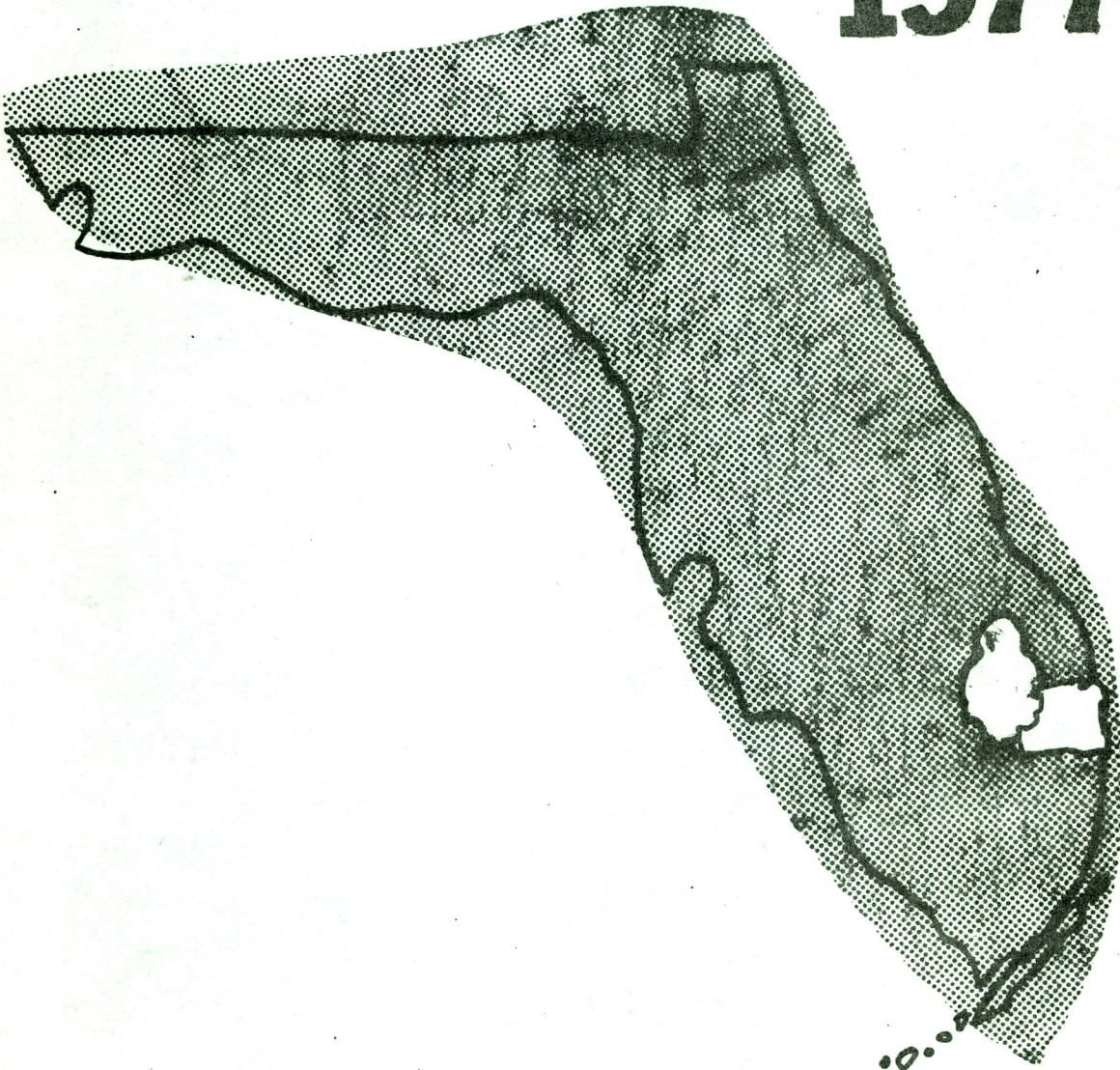


**PALM BEACH COUNTY, FLORIDA  
DIVISION OF ENVIRONMENTAL  
SCIENCE AND ENGINEERING  
AIR POLLUTION CONTROL**

# **ANNUAL REPORT 1977**



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# I

## INTRODUCTION

Palm Beach County is located along the southeast coast of Florida, and is part of what is generally called the "Florida Gold Coast". The "Gold Coast" consists of four counties: Palm Beach, Broward, Dade, and Monroe. Palm Beach County is geographically separated into two regions: one region is a highly urbanized coastal strip, stretching approximately forty-five (45) miles from Tequesta on the north, to Boca Raton on the south; and the other is agricultural, located in the western portion of Palm Beach County (the Glades Area).

The population distribution within the County depicts this same unusual pattern. Virtually all of the population is located in two relatively small areas: the coastal strip adjacent to the Atlantic Ocean and along a narrow band adjacent to Lake Okeechobee. A population table is included in this section.

The majority of the population, approximately 90%, is located on the coast for a distance of approximately ten miles inland from the Atlantic Ocean. Developments through the years have resulted in several municipalities along the coastal strip.

The band adjacent to Lake Okeechobee contains virtually all of the remaining 10% of the County's population. Municipalities which are included in the Glades area are: Belle Glade, Pahokee, and South Bay. The economy of this area is an agricultural one, based principally on sugarcane and winter vegetables.

Tourism and related fields continue to be the major economic factors of this area. Tourism has increased along with increased population. A good indicator of this increase is the number of passengers deplaning at the Palm Beach International Airport (PBIA). In 1977, 799,738 passengers deplaned at PBIA, as compared to 760,731 in 1976. Other major industries in the area include building construction and related fields, agriculture, aircraft testing facility, cement and concrete, asphaltic concrete, and the service industries.

The complexity of the problems of Air Pollution Control are related to the widespread growth of Palm Beach County. Advances in environmental protection activities, which are being carried out by this program, have been utilized in order to keep abreast of air pollution problems. These activities are characteristic of urban areas across the nation.

The administration of the state air permit system is one of the many activities handled by the Air Pollution Section of the Palm Beach County Health Department. The Department of Environmental Regulation requires both a permit to construct and a permit to operate any air pollution source. As administrator of the permit system, our local program is in the position to prevent the improper construction of a pollution source and to assure that adequate pollution control equipment is utilized and maintained.

Other activities include: consultations with industries and engineers on impending permit action; enforcement action; complex source requirements; and required compliance schedule and increments of progress surveillance. Also, our local program investigates and initiates the necessary follow-up action regarding all citizen complaints. As part of the State Air Implementation Plan, this agency is required to conduct source surveillance and source inspection of existing and new sources in Palm Beach County, in order to assure that all sources are in compliance with State air pollution regulations.

The air monitoring capabilities of our program continues to be the ultimate means of maintaining Air Quality Standards for Palm Beach County. The Environmental Control Air Monitoring Laboratory, which is located in West Palm Beach, has the capabilities of continuously measuring: Total Hydrocarbons (THC), Carbon Monoxide (CO), Sulfur Dioxide (SO<sub>2</sub>), Nitrogen Dioxide (NO<sub>2</sub>), Ozone (O<sub>3</sub>), and four meteorological parameters (Wind Speed, Wind Direction, Temperature, and



and Relative Humidity). All the aforementioned data are collected through the use of recorders plus a centrally controlled digital data acquisition system. The data is then transcribed on SAROAD (Storage and Retrieval of Aerometric Data) forms for input into the National Aerometric Data Bank.

A second completely continuous monitoring meteorological system (wind speed, wind direction, temperature, and relative humidity) along with a continuous SO<sub>2</sub> monitor is employed in the mobile air monitoring trailer, used in sampling of selected areas during periods of special interest. Additionally, the air pollution control program has continued its monitoring for the frequency and intensity of temperature inversions at the Division of Forestry's observation tower located at Loxahatchee, Florida and participated in the Florida Sulfur Oxide Study (FSOS) with SO<sub>2</sub> bubbler sites in Lake Harbor and North Palm Beach.

During 1977 the air quality monitoring network included thirteen (13) high volume particulate sites; one continuous monitoring site; one mobile air monitoring trailer, three (3) nitrogen dioxide bubbler sites and two SO<sub>2</sub> bubbler sites. Our chemistry laboratory located in Delray Beach handles all analysis pertaining to air pollution.

Public relation activities during the past year by the Air Pollution section of the Palm Beach County Health Department have consisted of continued steps to inform the general public of the programs and procedures established to maintain our good air quality. These activities include wide distribution of our Annual Report, extending invitations to groups of school children and environmental clubs to visit our facilities, and presentations to schools and civic groups throughout the County on the topic of "Air Pollution Control in Palm Beach County". In addition, a major aspect of our program's public relations activities is the dissemination, twice daily, of a "Pollution Standard Index" to the local news media. The index utilizes the daily results of all measured pollutants.

The residents of Palm Beach County are becoming more aware of the need for a thorough Air Pollution Program. In an effort to satisfy these needs, our program continues to increase in scope. This has been necessary to keep abreast of the requests of the people of Palm Beach County, to maintain good air quality, and protect the health and welfare of all concerned.



TABLE I  
PALM BEACH COUNTY, FLORIDA  
POPULATION

	<u>A.P.B.</u> <u>4-1-75</u>	<u>A.P.B.</u> <u>4-1-76</u>	<u>A.P.B.</u> <u>4-1-77</u>
Atlantis	1,102	1,129	1,221
Belle Glade	16,192	16,331	16,738
Boca Raton	41,852	45,561	47,066
Boynton Beach	37,460	34,949	35,237
Briny Breeze	798	798	798
Cloud Lake	136	136	136
Delray Beach	33,674	35,043	36,242
Glen Ridge	211	208	208
Golf (Village )	125	125	137
Golfview	210	210	210
Greenacres City	4,278	5,437	5,858
Gulf Stream	500	600	600
Haverhill	1,134	1,140	1,154
Highland Beach	1,444	1,879	2,172
Hypoluxo	385	389	377
Juno Beach	1,067	1,206	1,211
Jupiter	7,252	7,408	8,120
Jupiter Inlet Colony	464	468	468
Lake Clarke Shores	3,378	3,417	3,463
Lake Park	8,791	9,035	9,209
Lake Worth	27,832	28,361	28,573
Lantana	8,284	8,962	9,054
Manalapan	267	300	301
Mangonia Park	1,838	1,855	1,862
North Palm Beach	13,123	14,978	15,001
Ocean Ridge	1,227	1,275	1,301
Pahokee	5,805	5,814	5,860
Palm Beach	9,924	10,076	10,202
Palm Beach Gardens	10,573	11,522	12,497
Palm Beach Shores	1,044	1,044	1,092
Palm Springs	8,469	9,659	9,689
Riviera Beach	27,704	29,778	31,148
Royal Palm Beach	3,129	3,259	3,858
South Bay	3,415	3,498	3,498
South Palm Beach	1,620	1,620	1,684
Tequesta Village	3,882	4,009	4,056
West Palm Beach	65,248	65,368	64,934
Total Incorporated Area	353,837	366,847	375,235
Unincorporated	161,423	176,701	182,394
Total County	515,260	543,548	557,629

## II

### METEROLOGY

#### GENERAL

Topography is of primary importance whenever the meteorological aspects of a given region are to be evaluated. Palm Beach County is a fairly level region. For the most part, Palm Beach County is between 10 and 20 feet above sea level. All urban development is located along the eastern 10 miles of the coastal strip. Most of the western portions of the County are covered by agricultural lands or everglades. The agricultural lands are endowed with a rich peat-like "muck" soil. The Atlantic Ocean borders the eastern edge of the County and the Gulf Stream flows northward approximately 3 miles off-shore. Seldom does a cold air mass reach this region without being modified, due to marine influences and our southern location. Light freezes occur infrequently along the coastal areas of the County and more frequently in the everglades and agricultural areas. The most eastern parts of the County come under the influence of the sea breeze during the day and land breeze during the night. Based on weather data accumulated at Palm Beach International Airport from year 1941 to year 1970 (Table 2), August is the warmest month with a mean of 82.3°F, a maximum mean of 90.2°F, and minimum mean of 74.4°F. From the same data, January is the coldest month with a mean of 65.5°F, a maximum mean of 75.0°F and a minimum mean of 55.9°F. Rain showers and/or thunderstorms of short duration are frequent during the summer season. Palm Beach County receives the greatest amount of rainfall during the summer and fall. As indicated in Table 2, in those 30 years of record the County received an average 62.06 inches of rain per year.

Palm Beach County can be classified as a semitropical region. The Quasi-permanent location of the "Bermuda" high pressure area governs our weather. It



causes our prevailing easterly surface winds in addition to supplying the warm moist air necessary to produce the frequent air mass, frontal or nocturnal rainshowers and/or thunderstorms that occur in the County. The position of the "Bermuda" high pressure area is also conducive to the formation of an atmosphere capable of causing high pollution days. This atmosphere can easily occur if cold air from the north moves underneath the warm moist air brought into the County by the "Bermuda" high. The result is a temperature inversion or increase of temperature with height which traps the pollutants in the lower levels.

Meteorological parameters play a significant role in understanding the over-all air pollution cycle. The motions of the atmosphere are extremely variable and must be thoroughly examined in order to determine the movement and dispersment of pollutants.

#### WIND

Both wind direction and wind speed are of primary importance. The surface wind and the wind found in the first few hundred feet of our atmosphere must be studied to determine diffusion and movement of the pollutants. The wind direction is indicative of the direction of travel of the pollutants. The wind speed determines the time it takes the pollutants to travel to a receptor and is a function of the amount of dilution of the pollutant. Light winds, coupled with other factors, contribute to poor air quality episodes. U.S. Weather Service records for Palm Beach International Airport show the prevailing wind directions for the months of February through November are from one of the easterly headings. Mean monthly speeds vary between 7.4 knots in August and 10.9 knots in April (Table 2). The wind direction and speed for the year 1977 (Table 5) taken at our continuous monitoring site in West Palm Beach shows that a higher percentage of winds were from the east-northeast, east, or east-southeast directions and the majority of

TABLE 2  
PALM BEACH COUNTY AIRPORT  
METEOROLOGICAL MEANS (1941-1970)

MONTH	MEAN MAXIMUM TEMPERATURE	MEAN MINIMUM TEMPERATURE	MEAN MONTHLY TEMPERATURE	MEAN MONTHLY PRECIP. (IN)	PREVAILING WIND DIRECTION	MEAN WIND SPEED
JANUARY	75.0	55.9	65.5	2.60	NW	9.8
FEBRUARY	76.0	56.2	66.1	2.60	SE	10.3
MARCH	79.3	60.2	69.8	3.32	SE	10.7
APRIL	82.9	64.9	73.9	3.51	E	10.9
MAY	86.1	68.9	77.5	5.17	ESE	9.6
JUNE	88.3	72.7	80.5	8.14	ESE	8.0
JULY	89.6	74.1	81.9	6.52	ESE	7.5
AUGUST	90.2	74.4	82.3	6.91	ESE	7.4
SEPTEMBER	88.3	74.7	81.5	9.85	ENE	8.7
OCTOBER	84.3	70.1	77.2	8.75	ENE	10.0
NOVEMBER	79.5	62.5	71.0	2.48	ENE	9.9
DECEMBER	76.1	57.4	66.8	2.21	NNW	9.9
YEARLY	83.0	66.0	74.5	62.06	ESE	9.4

Wind speed in knots. Multiply by 1.15 to obtain mi/hr.

the wind speeds were in the 4-10 mi/hr category. Table 6, wind direction and speed (Belle Glade) is included in this section for information purposes.

#### ATMOSPHERIC STABILITY

The dilution of pollutants in the atmosphere depends greatly on the vertical temperature gradient in the first few hundred feet of the atmosphere. When the vertical temperature gradient decreases with height the atmosphere is unstable and good dilution of pollutants is the result. This normally occurs in Palm Beach County during the summer season and/or the warmer hours of each day. If the vertical temperature gradient increases with height within the first few hundred feet of the atmosphere, a stable condition is caused, often called an inversion, which results in poor dilution of pollutants. This occurs in Palm Beach County more frequently during the winter and fall seasons and/or the cooler hours of each day. If pollutants are present during these periods they are trapped beneath the inversion and remain there until the inversion is dissipated by surface heating.

Table 3 shows Miami and Tampa data taken from C.R. Hosler's report entitled, "Low Level Inversion Frequency in the Contiguous United States" (1961).

TABLE 3

Percent Frequency of Occurrence of Inversions with Base Less than 500 Feet Above Station Elevation (C.R. Hosler)

TIME	(EST)	1900	<u>MIAMI</u>			1900	<u>TAMPA</u>		
			2200	0700	1000		2200	0700	1000
FALL		19	41	73	3	25	63	76	2
WINTER		29	39	60	6	28	69	60	17
SPRING		10	27	47	2	7	69	52	1
SUMMER		21	27	65	2	14	62	57	8



Based on the percentages shown in the above table it is reasonable to assume that inversions with a base less than 500 feet occur in Palm Beach County during the fall and winter seasons between the hours of 2000 (8:00 P.M.) and 0800 (8:00 A.M.) 50% of the time. The inversion frequency percentages for the spring and summer seasons during the same time frame are also substantial and should not be overlooked in the course of a pollution study. At this time it is interesting to note two important thoughts: (1) Hosler only considered very shallow inversions (less than 500 feet), yet inversions with higher bases are also capable of causing poor air quality; (2) the interior area of Palm Beach County experience lower night time temperatures and therefore must have a higher frequency of inversions, especially during the fall and winter seasons. C.R. Hosler's report was strengthened by Mr. Harold P. Gerris of the Meteorology Department of the University of Miami who conducted a thorough study and prepared a paper entitled, "Analysis of Low-Level Temperature Inversions in the Miami Area Using Instrumented Towers". He placed two instrumented towers in the Miami Area, one on the coast and the other 16 miles inland. The analysis of the temperature data revealed that nocturnal inversions occurred almost every night within 200 feet of the ground. The inversions that occurred inland were 3-4 times stronger than those that occurred on the coast. The inversions lasted approximately 10 hours inland. He showed that the inversions formed shortly after sunset and dissipated shortly after sunrise. The sampling period began on February 17, 1971, and lasted until May 27, 1971.

#### MIXING HEIGHTS

The mixing height or depth is defined as the height above the surface through which vertical mixing takes place. The mixing height value depends on the local stability of the atmosphere and the surface temperature. The greatest mixing height values occur during the summer season and warmer hours of the day. The

minimum mixing height values occur during the winter season and cooler hours of the day. The greater the mixing height the greater amount of air available to dilute a pollutant.

Table 4 shows mixing height data for Palm Beach County, Miami, and Tampa taken from G.C. Holworth's Report entitled, "Mixing Heights, Wind Speeds and Potential for Urban Air Pollution Throughout the Contiguous United States". (1971)

TABLE 4

SEASONAL MEAN MIXING HEIGHTS IN FEET ABOVE GROUND ELEVATION FOR MORNING HOURS AND AFTERNOON HOURS. (DAYS WITH NO PRECIPITATION)

---

PBC (INTERPOLATION)			MIAMI		TAMPA	
	Mnn.	Aft.	Mnn.	Aft.	Mnn.	Aft.
FALL	2640	4290	2877	4339	1382	4623
WINTER	2310	3960	2158	3986	1300	3471
SPRING	3052	4620	3125	4752	1659	5025
SUMMER	3382	4290	3435	4488	2164	4818
ANNUAL	2846	4267	2897	4389	1626	4484

---

The values in the above table clearly show that on the average, the greatest volume of air for the mixing of pollutants is available during the afternoon hours. The fall and winter seasons experience the least volume of air available for mixing, especially during the morning hours and therefore are subject to a greater potential for poor air quality.

During this report period the U.S. Weather Service established a rawinsonde station at PBIA. The data will allow the determination of atmospheric stability in Palm Beach County on a daily basis.

TABLE 5  
SITE #1 - WEST PALM BEACH  
WIND DIRECTION AND SPEED (MI/hr) OCCURRENCES  
1977

Direction	1-3	4-6	7-10	11-16	17-21	22-27	TOTAL	PERCENT
35-36-01 (N)	135	209	199	97			640	7.47
02-03-04 (NNE)	208	270	170	22			670	7.82
05-06-07 (ENE)	225	564	351	22			1162	13.56
08-09-10 (E)	145	423	522	110		1	1201	14.02
11-12-13 (ESE)	121	310	399	107			937	10.94
14-15-16 (SSE)	122	188	215	234	11		770	8.99
17-18-19 (S)	172	117	100	35	2		426	4.97
20-21-22 (SSW)	185	142	80	27	13		447	5.22
23-24-25 (WSW)	128	92	73	39	9	1	342	3.99
26-27-28 (W)	171	108	73	24	1		377	4.40
29-30-31 (WNW)	191	154	137	36	7	1	526	6.14
32-33-34 (NNW)	203	219	154	33	1		610	7.12
CALM	460						460	5.37
TOTAL	2466	2796	2473	786	44	3	8568	
PERCENT	28.78	32.63	28.86	9.17	0.51	0.04		



TABLE 6  
SITE #8 - BELLE GLADE  
WIND DIRECTION AND SPEED (MI/hr) OCCURRENCES  
1977

DIRECTION	1-3	4-6	7-10	11-16	17-21	22-27	TOTAL	PERCENT
35-36-01 (N)	208	166	128	11			513	11.18
02-03-04 (NNE)	368	115	71	4			558	12.16
05-06-07 (ENE)	207	117	97	8			429	9.35
08-09-10 (E)	214	130	69				413	9.00
11-12-13 (ESE)	150	113	38				301	6.56
14-15-16 (SSE)	173	122	51	1			347	7.56
17-18-19 (S)	213	104	48	8			373	8.13
20-21-22 (SSW)	214	102	53	16			385	8.39
23-24-25 (WSW)	118	52	10	7			187	4.07
26-27-28 (W)	112	67	15	1			195	4.25
29-30-31 (WNW)	77	54	7	2			140	3.05
32-33-34 (NNW)	179	229	116	16			540	11.76
CALM	209						209	4.55
TOTAL	2442	1371	703	74			4590	
PERCENT	53.20	29.87	15.32	1.61				

In addition, the Air Pollution Section of the Palm Beach County Health Department has collected vertical low level temperature data for the past four (4) years at the Division of Forestry Observation tower at Loxahatchee, Florida. Temperature data is taken at the 25 foot, and 100 foot levels. The equipment continuously collects data in order to monitor the frequency and strength of low level inversions and mixing heights. The data collected thus far verifies the existence of frequent low level inversions and shallow mixing heights during evening and early morning hours.

#### CONCLUSION

Meteorological parameters during the spring and summer seasons in Palm Beach County are more favorable for good air quality than the fall or winter seasons. The fall and winter season experience a higher frequency of inversions (stable air), less rain fall (cleaning agent) and more shallow mixing heights (small volume of air for dilution), all of which hinder the diffusion of pollutants.

As time goes on and more of the aforementioned meteorological studies become available, it will become increasingly evident that serious nocturnal inversions exist. Good planning, therefore, will be mandatory in order to protect our present good air quality and still permit a healthy growth of industry in Palm Beach County.

### III COMPLAINTS AND INVESTIGATIONS

During the reporting period of January 1, 1977 through December 31, 1977 the Air Pollution Control staff received and investigated the same number of complaints as they did in the 1976 reporting period, one hundred six (106).

The number of complaints in each classification were:

1. Industrial Fumes or Dust	23
2. Commercial Incinerators	0
3. Open Burning	23
4. Internal Combustion Engine Fumes & Exhaust	1
5. Odors	8
6. Construction Dust & Fumes	11
7. Noise	23
8. Pollen Deposits	3
9. Unknown Sources	5
10. Miscellaneous	9

Total	106
-------	-----

While the total number of complaints received this reporting period were the same as the last reporting period, the numbers in the different classifications changed as follows:

Industrial Fumes or Dust	up 3 or 15%
Commercial Incinerators	down 3 or 100%
Open Burning	down 2 or 8%
Internal Combustion Engine Fumes & Exhaust	down 2 or 67%
Odors	down 12 or 60%
Construction Dust & Fumes	up 6 or 120%
Noise	up 10 or 77%
Pollen Deposits	down 1 or 25%
Unknown Sources	down 1 or 17%
Miscellaneous	up 2 or 29%

The large increase in construction dust and fume, and noise complaints, 120% and 77% respectively, can be attributed to the area wide increase in construction of all types.



Contractors clear the vegetation from large tracts of land leaving an expanse of sand to become airborne and deposited on adjacent property. Also in many of these developments underground utilities must be installed, necessitating the running of large dewatering pumps around the clock for weeks at a time.

#### IV INSPECTIONS, SURVEILLANCE AND ENFORCEMENT

The inspection, surveillance and enforcement activities of the Air Pollution Control (APC) section of the Palm Beach County Health Department (PBCHD) continues to operate in accordance with established statutes and codes of the State of Florida. The Palm Beach County Environmental Control Ordinance adopted by reference those State codes and statutes that pertain to environmental matters. This arrangement enables the County to fulfill the requirements set forth in the State Air Implementation Plan (SIP), with a minimum of expense and without duplication of effort and facilities.

The APC section of the PBCHD works closely with the Palm Beach County Environmental Control Office (ECO), an attorney appointed by the Palm Beach County Environmental Control Board. The ECO has the statutory duty to enforce the Palm Beach County Environmental Control Ordinance. If voluntary compliance fails, enforcement activities are directed to the ECO; Agriculture matters, which are exempt from the local ordinance, are resolved through cooperation with the Florida Department of Environmental Regulation (FDER).

The aforementioned exemption precludes this agency (APC) from directly regulating agricultural related environmental matters or prosecuting violators of air pollution control regulations. Consequently, as agents for the FDER, it is necessary for APC to maintain a strong liaison with the FDER in order to control agricultural environmental matters within the political boundaries of Palm Beach County.

In order to comply with inspections, surveillance, and enforcement directives prescribed in the Palm Beach County Environmental Control Ordinance and the Florida SIP, the APC section provides the following services:

1. Reviews construct and operate permit applications, and recommends approval or disapproval of same.
2. Inspects existing and new sources.
3. Conducts aerial and ground surveillance programs.

4. Maintains records on permits, inspections, surveillance, and enforcement actions.
5. Monitors compliance schedules and increments of progress.
6. Investigates all citizen complaints.
7. Prepares enforcement summaries for all violations.
8. Monitors stack sampling procedures.

The APC inspector/investigator constitutes the primary field operations arm for this agency. An inspector/investigator must deal with the needs and problems of air pollution sources along with other environmental, economic, legal and social considerations that are encountered in the field. The inspector/investigator performs a vital role for this agency in its air pollution control program. He has direct responsibility for surveillance of all air pollution sources and enforcement of applicable regulations. Personnel performing inspections are often the only contact between our agency and industry. As this agency's representative, the inspector must explain the programs of the agency, including such elements as emission regulations, procedures during air pollution emergency episodes, open burning regulations, and requirements to construct and/or operate an air pollution source.

There are 191 permitted sources in Palm Beach County. These include 73 major or Class A facilities which are capable of emitting over 100 tons of a single pollutant, 23 minor or Class B facilities which are capable of emitting between 10 and 100 tons of a single pollutant, the remainder are area sources which have the capability of emitting less than 10 tons of a single pollutant, and complex sources. This agency conducted 256 source inspections, monitored 26 stack sampling tests and completed 48 visible emission evaluations during this reporting period.

There were sixty-one (61) violations of air pollution control regulations observed during this reporting period. Of these, forty-three (43) were violations



V  
TECHNICAL STUDIES

INTRODUCTION

The ambient air monitoring program in Palm Beach County now consists of the following:

Suspended Particulate (Daily/Monthly) - 13 Sites

Total Gravimetric

Benzene Soluble Organics

Sulfates

Nitrates

Continuous Gaseous Monitoring - 1 Site

Carbon Monoxide

Total Hydrocarbons

Sulfur Dioxide

Ozone

Continuous Gaseous Monitoring - 1 Site

Sulfur Dioxide

Continuous Meteorological Monitoring - 2 Sites

Wind Speed

Wind Direction

Temperature

Relative Humidity

Continuous Temperature Inversion Monitoring - 1 Site

Temperature, 2 Levels

Manual Gaseous Monitoring

Nitrogen Dioxide - 3 Sites

Sulfur Dioxide - 2 Sites

Microscopic Morphology

All data collected is reported monthly to the Department of Environmental Regulation and to the Environmental Protection Agency (SAROAD) for inclusion in air quality data banks. Gaseous pollutant levels and meteorological conditions from one site are relayed by data line to the agency's office data acquisition system. Instantaneous levels of these parameters are available at all times. One, three, eight and twenty-four hour averages are calculated and recorded.

Locations of the monitoring sites are shown in Figure 1. Table 7 gives site identification numbers, addresses, and parameters measured for all monitoring sites within the County. Table 8 relates measured air quality within Palm Beach County for the year 1977 to the Ambient Air Quality Standards.

#### PERMANENT MONITORING NETWORK

The permanent monitoring network for suspended particulate, sites one thru eight, were established in 1969. The Military Trail intercept line, sites nine thru twelve, were added in 1972. Ten of these twelve stations have been maintained as suspended particulate monitoring sites thru the report period. The St. Vincent De Paul site was discontinued in July 1976 and the Grammercy Park site was discontinued in February of 1977. One station for monitoring total suspended particulate, located in Pahokee has been added during the current report period.

Methodology: Standard High volume Samplers and shelters are located at each of the thirteen sites. Samples are collected and handled in accordance with Reference Method for the Determination of Suspended Particulates in the Atmosphere (High Volume Method), Federal Register, Vol. 36, No. 84 - Friday, April 30, 1971. Sampling time is twenty-four hours, running from midnight to midnight for each sampling date. The standard six day schedule as recommended by EPA is followed.

Nitrate and Sulfate determinations are made according to procedures described in Selected Methods for the Measurement of Air Pollutants, U. S. Department of Health, Education and Welfare, May, 1965; Public Health Service Publication No. 9998-AP-11. Benzene soluble organics are determined by procedures described in Analysis of Atmospheric Organics, a Training course manual published by the U. S. Department of Health, Education and Welfare.

Tabulated results for suspended particulate for the year 1977 are presented in tables 9, 10, and 11. Figure 2 presents the range of probable logarithmic values for suspended particulate at all thirteen stations for the years 1976 and 1977. A historical summation for total suspended particulate measurements from 1969 to the present is presented in Tables 12 and 13.

Hi Volume Sampling values for the 24th of June, 1977 have been omitted from the reported suspended particulate data. All stations were influenced by dust transported from a storm in the Sahara Desert. Values recorded for this date were:

Station	T.S.P., ug/m <sup>3</sup>
1	140
2	108



Station	T.S.P., $\mu\text{g}/\text{m}^3$
3	106
4	123
5	110
6	106
7	91
8	154
10	124
12	93
16	93
17	138
18	107

With the exception of Site #1, these values were the maximums recorded at each station.

#### GASEOUS MONITORING

Periodic automated monitoring of sulfur dioxide, nitrogen dioxide and total oxidants at sites 1 thru 8 was begun in June of 1970. Carbon monoxide monitoring was added in January of 1971. Total hydrocarbon monitoring was begun in May of 1972. The automated gaseous and meteorological monitoring equipment was installed in the permanent monitoring station (site 1) in November of 1972. Original Technicon Monitoring equipment for nitrogen dioxide, sulfur dioxide and total oxidants was replaced during the third quarter of 1973. The monitoring of total oxidants was discontinued and replaced by the monitoring of ozone. A special study of sulfur dioxide levels and meteorological parameters was begun in Belle Glade (site 8) in September of 1972. Two manual stations for the measurement of nitrogen dioxide were established in November of 1973. These sites are

maintained as part of the State Air Quality Surveillance Program as required by the State Air Implementation Plan. An additional NO<sub>2</sub> bubbler was installed at the North Palm Beach site and has been in operation throughout the last two report periods.

The Palm Beach County Health Department participated in the Florida SO<sub>2</sub> study. A suspended particulate, SO<sub>2</sub> bubbler site was placed in Lake Harbor and began collecting data on September 27, 1976. The North Palm Beach monitoring program was expanded with the installation of a SO<sub>2</sub> bubbler. Data has been available from this site since September 9, 1976. All bubblers are operated on the standard six day schedule.

Maximum ambient air concentrations for gaseous sampling in Palm Beach County for the period 1970 - 1977 are presented in Table 14.

#### NITROGEN DIOXIDE

Continuous automatic monitoring for this pollutant is carried on at Site 1. A MEC Model 1200 NO-NO<sub>x</sub> (McMillan Electronics Corporation) chemiluminescence analyzer was in use from November 15, 1973 until December 27, 1977. At this time it was replaced by Monitor Laboration Model 8440. Table 15 presents monthly and annual sampling time, arithmetic means and twenty-four hour maximum concentrations. Values recorded during the periods of operation indicate levels of this pollutant well below those specified by the Ambient Air Standard. Table 16 includes quarterly and annual one, eight and twenty-four hour maximums, annual arithmetic means and the frequency distribution of ranges of pollutant levels recorded.

Manual samplers for this pollutant are operated at Sites 3, 13 and 14. Sampling procedure is as described in the Federal Register. Volume 38, No. 110, Friday June 8, 1973. Frequency of sampling is every sixth day. Table 17 presents number of samples, arithmetic averages and

twenty-four hour maximums for each of the sites. Values recorded place the measured concentrations of this pollutant well below those of the Ambient Air Quality Standard. Tables 18, 19 and 20 give monthly and annual sampling frequency, maximum recorded values, and arithmetic means for each station.

#### CARBON MONOXIDE

This pollutant is monitored continuously at Site 1. A Mine Safety Appliances, Model 200 nondispersive infrared spectrophotometric automatic analyzer was retired and replaced by a Model 202-S on October 6, 1977.

Table 21 presents a monthly record of sampling hours, one and eight hour maximums, and relates concentration maximums to the Ambient Air Quality Standard. There were no recorded values in excess of the one hour or eight hour standards.

Table 22 presents quarterly, one and eight hour maximum values and frequency distribution of all recorded pollutant levels.

#### OZONE

This pollutant is monitored continuously at Site 1. The instrumentation is a MEC Model 1100 (McMillan Electronic Corporation) chemiluminescence analyzer.

Table 23 presents a monthly record of hours sampled and one hour maximums recorded. There were twenty-eight values recorded which exceed the Ambient Air Quality Standard for this pollutant.

One, eight and twenty-four maximums and the frequency distribution for all pollutant levels recorded are presented on a quarterly basis in Table 24.

#### TOTAL HYDROCARBONS

This pollutant is monitored on a continuous basis at Site 1.



Instrumentation is a Mine Safety Appliances Flame Ionization Total Hydrocarbon analyzer.

Table 25 reports hours sampled and maximum three hour values recorded, six to nine A.M., on a monthly basis. These hours are chosen as they were in the establishment of the Ambient Air Quality Standards, to reflect the influence of the morning peak traffic hours. The standard for hydrocarbon relates to hydrocarbon concentrations after subtracting methane concentrations. Because instrumentation to measure methane is not available to this agency, no such correction can be made to the values recorded and no attempt is made to relate recorded values to ambient air quality standards.

Maximum one, eight, twenty-four and three hour (6-9 a.m.) concentration are reported in Table 26 on a quarterly basis. A frequency distribution for all values recorded is also presented.

#### SULFUR DIOXIDE

This pollutant is measured continuously at two sites within the County.

Site 1, located in West Palm Beach, monitors sulfur dioxide levels in the coastal region of the County. Instrumentation for this site is a Beckman 906-A Sulfur Dioxide analyzer based on coulometric titration. Table 27 reports a monthly history of hours sampled, one, three, and twenty-four hour maximums, and the number of violations for each of the related standards. Table 28 presents a quarterly and annual record of maximum values and a frequency distribution of values recorded. Calculation of an arithmetic mean for this pollutant is not feasible because ninety-six percent of the values are below the limit of sensitivity for the instrument.

The same instrumentation, a Beckman 906-A has been used to monitor sulfur dioxide in the West County Area. This sampling program was initiated on July 8, 1975. The monitor is located in a converted trailer which

allows for simultaneous measurement of meteorological conditions. The trailer is located at the Palm Beach County Health Department, Canal Street, Belle Glade, Florida. Table 29 reports a monthly history of hours sampled, one, three, and twenty-four maximums, and the number of violations for each of the standards. Table 30 presents a quarterly and annual record of maximum values and a frequency distribution of values recorded.

Manual sampling of sulfur dioxide has been carried on since September, 1976, at two sites by this agency. This sampling is in accord with the Federal Reference Method and the standard six day schedule is maintained. Table 31 presents a summary of levels measured at these sites. Table 32 and 33 record a monthly record of sampling including maximums and means.

TABLE 7  
MONITORING SITE LOCATIONS

SITE NO.	ADDRESS	UTM ZONE 17	MONITORING CAPABILITY
1	West Palm Beach Water Treatment Plant First Street and Tamarind Ave. West Palm Beach, Florida	2955030N 0593232E	Susp. Part. THC, CO, SO <sub>2</sub> NO <sub>2</sub> , O <sub>3</sub> Meteorology
2	Tequesta Water Department 357 Tequesta Drive Tequesta, Florida	2982018N 0589963E	Susp. Part.
3	North Palm Beach Water Treatment Plant 603 Anchorage Drive North Palm Beach, Florida	2965817N 0592780E	Susp. Part. SO <sub>2</sub> , NO <sub>2</sub>
4	Lake Worth Water Treatment Plant 301-303 College Street Lake Worth, Florida	2943537N 0592793E	Susp. Part.
5	Delray Beach Water Treatment Plant 202 N.W. 1st Avenue Delray Beach, Florida	2927488N 0592195E	Susp. Part.
6	Boca Raton Fire Station #1 1151 N. Federal Highway Boca Raton, Florida	2915768N 05913137E	Susp. Part.
7	Royal Palm Beach Golf Course Royal Palm Beach Blvd. Royal Palm Beach, Florida	2951437N 0578767E	Susp. Part.
8	Belle Glade Water Treatment Plant 1016 West Canal Street Belle Glade, Florida	2953082N 0533160E	Susp. Part. SO <sub>2</sub> Meteorology
9	Grammercy Park Water Treatment Plant Park Avenue Grammercy Park, Florida	2960537N 0587329E	Discontinued Feb.1, 1977
10	Southwest Fire Department 1180 S. Military Trail West Palm Beach, Florida	2949018N 0588207E	Susp. Part.



TABLE 7  
MONITORING SITE LOCATIONS (cont.)

SITE NO.	ADDRESS	UTM ZONE 17	MONITORING CAPABILITY
11	St. Vincent DePaul Seminary S. Military Trail Boynton Beach, Florida	2932890N 0586927E	Discontinued July 17, 1976
12	College of Boca Raton S. Military Trail Boca Raton, Florida	2918354N 0587320E	Susp. Part.
13	NO <sub>x</sub> SIP Site N8 Florida Atlantic University Boca Raton, Florida	2917000N 0589500E	NO <sub>x</sub>
14	NO <sub>x</sub> SIP Site N9 Palm Beach Mall Palm Beach Lakes Blvd. West Palm Beach, Florida	2956000N 0590700E	NO <sub>x</sub>
15	Division of Forestry Lat. 26° 41'N Loxahatchee, Florida Long 80° 16'E		Temperature Inversion
16	Flood Control Pump Station Twenty Mile Bend State Road 80	2951402N 0562879E	Susp. Part.
17	Lake Harbor Water Treatment Plant Lake Harbor, Florida		Susp. Part. SO <sub>2</sub>
18	Pahokee Health Department 1759 E. Main Street Pahokee, Florida		Susp. Part.

ATLANTIC

OCEAN

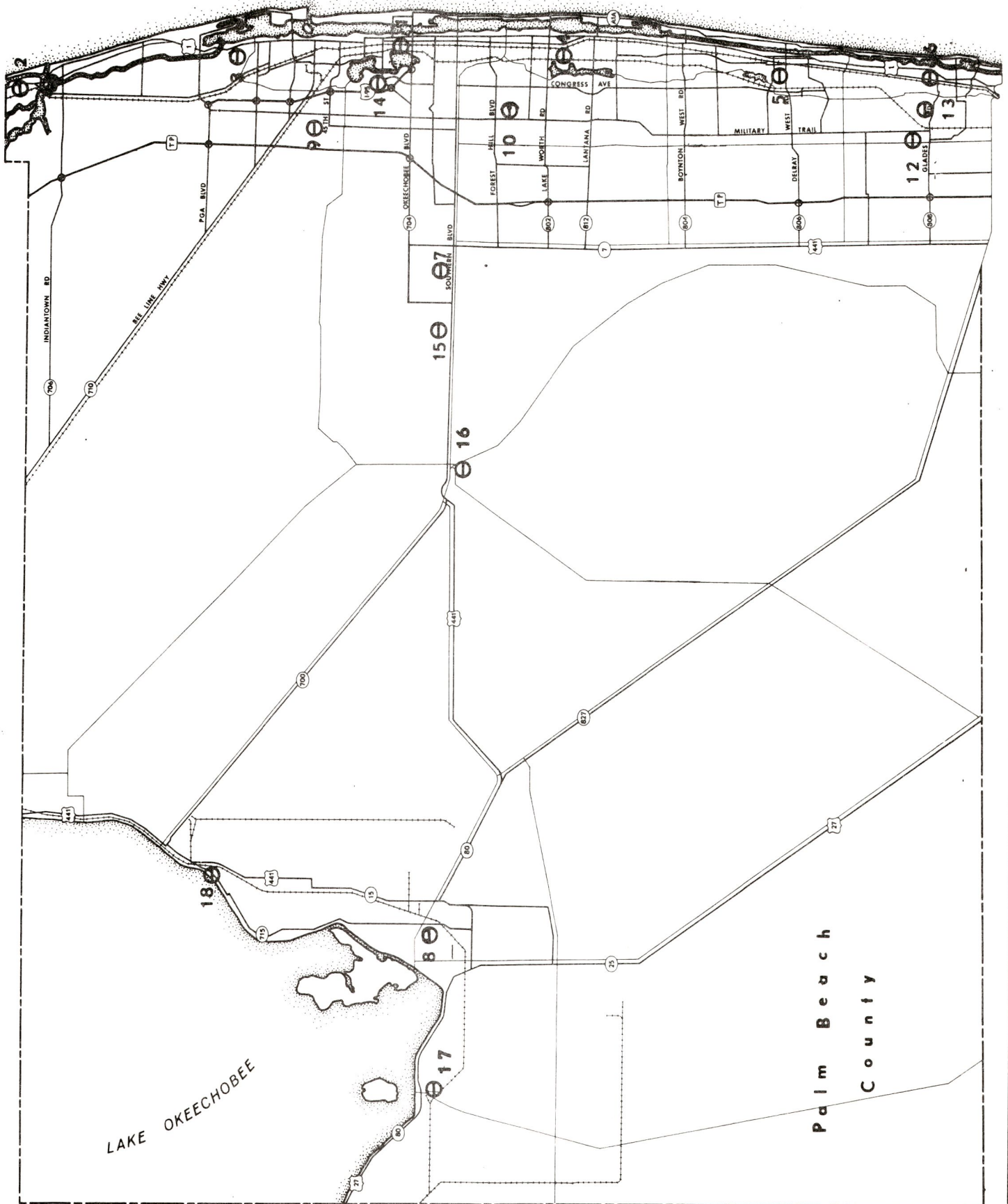


Figure 1 Ambient Air Monitoring Network

TABLE 8  
AMBIENT AIR QUALITY STANDARDS

POLLUTANT (1)	FEDERAL PRIMARY	FEDERAL SECONDARY	STATE	MEASURED LEVELS PALM BEACH COUNTY				
Suspended Particulates				See Table #9				
Annual Geo. Mean	75	60	60	SITE				
Maximum 24 hr. Conc.(2)	260	150	150	<u>1</u>	<u>8</u>	<u>3</u>	<u>13</u>	<u>14</u> <u>17</u>
				ppm		ug/m <sup>3</sup>		
Sulfur Oxides								
Annual Arith. Mean	80		60					
	(0.03 ppm)		(0.02 ppm)	0.003	0.006	1		1
Maximum 24 hr. Conc.	365		260					
	(0.14 ppm)		(0.1 ppm)	0.009	0.016	10		8
Maximum 3 hr. Conc. (2)		1,300	1,300					
		(0.5 ppm)	(0.5 ppm)	0.015	0.029			
Carbon Monoxide								
Maximum 8 hr. Conc. (2)	10	Same as	Same as					
	(9 ppm)	Federal	Federal	8.5				
Maximum 1 hr. Conc.	40	Primary	Primary					
	(35 ppm)			11.8				
Photo Chem Oxidants								
Maximum 1 hr. Conc. (2)	160	Same as	Same as					
	(0.08 ppm)	Federal	Federal	0.106				
		Primary	Primary					
Nitrogen Oxides								
Annual Arith. Mean	100	Same as	Same as					
	(0.05 ppm)	Federal	Federal	0.017		18	16	29
Hydrocarbons max. 3 hr. Conc.								
(6-9 am) (2) (3) (4)	160	Same as	Same as	3.2				
	(0.24 ppm)	Federal	Federal					
		Primary	Primary					

- (1) All measurements are in ug/m<sup>3</sup> except CO which is mg/m<sup>3</sup>, or when indicated as ppm.  
 (2) Concentration limits not to be exceeded more than once per year.  
 (3) Used as a guide in devising plans to achieve oxidant standard.  
 (4) Palm Beach County values not methane corrected.



TABLE 9  
SUSPENDED PARTICULATE MATTER, 1977

Geometric Mean,  $\mu\text{g}/\text{m}^3$

SITE NO.	1ST QTR	2ND QTR	3RD QTR	4TH QTR	ANNUAL	GEO STD DEV	% ABOVE OR BELOW ANNUAL STANDARD (60 $\mu\text{g}/\text{m}^3$ )	24 HR MAX in $\mu\text{g}/\text{m}^3$	NO. OF SAMPLES ABOVE DAILY STANDARD (150 $\mu\text{g}/\text{m}^3$ )	TOTAL NO. OF SAMPLES COLLECTED
1	45.9	42.0	28.0	40.0	38.3	1.50	-36.17	172	1	60
2	43.1	35.4	20.9	27.8	30.9	1.50	-48.50	74	0	59
3	35.9	29.4	22.4	27.7	28.4	1.45	-52.67	62	0	58
4	45.3	45.5	29.7	38.9	39.1	1.38	-34.83	84	0	56
5	42.7	43.1	28.8	34.7	37.0	1.41	-38.33	81	0	59
6	43.3	41.6	29.7	35.3	37.0	1.43	-38.33	79	0	59
7	29.2	27.2	16.0	20.3	22.5	1.49	-62.50	64	0	60
8	70.7	59.6	37.0	58.8	54.6	1.49	- 9.00	149	0	57
10	49.8	41.5	30.6	37.3	39.2	1.40	-34.67	98	0	60
12	35.8	30.1	21.4	26.1	27.9	1.43	-53.50	66	0	59
16	38.6	32.3	20.9	23.2	28.2	1.52	-53.00	76	0	54
17	35.4	49.3	23.7	26.2	31.6	1.53	-47.33	69	0	56
18		39.5	25.3	27.1				63	0	44

TABLE 10  
TOTAL SUSPENDED PARTICULATES - 1977

SITE NO.	J	F	M	A	NUMBER OF SAMPLES						N	D	TOTAL	MAX	CONCENTRATION $\mu\text{g}/\text{m}^3$				Sg.
					M	J	J	A	S	O					2ND MAX.	MIN	A. MEAN	G. MEAN	
1	6	4	5	5	6	4	5	5	5	5	5	5	60	172	98	17	42.0	38.3	1.50
2	6	4	5	5	6	4	4	5	5	5	5	5	59	74	71	12	33.6	30.9	1.50
3	6	4	5	5	5	3	5	5	5	5	5	5	58	62	62	11	30.4	28.4	1.45
4	6	4	5	4	5	4	5	5	5	4	4	5	56	84	74	14	41.0	39.1	1.38
5	6	4	5	5	6	4	5	5	4	5	5	5	59	81	77	18	39.1	37.0	1.41
6	5	4	5	5	6	4	5	5	5	5	5	5	59	79	77	15	39.3	37.0	1.43
7	6	4	5	5	6	4	5	5	5	5	5	5	60	64	42	9	24.3	22.5	1.49
8	6	3	5	3	6	4	5	5	5	5	5	5	57	149	142	17	59.0	54.6	1.49
9	6												6	33	33	20			
10	6	4	5	5	6	4	5	5	5	5	5	5	60	98	76	19	41.4	39.2	1.40
12	6	4	5	5	6	4	5	5	5	5	4	5	59	66	56	14	29.8	27.9	1.43
16	6	4	4	4	6	4	5	2	4	5	5	5	54	76	76	12	30.9	28.2	1.52
17	5	5	5	5	4	3	5	5	5	5	4	5	56	69	66	10	34.6	31.6	1.53
18				5	5	4	5	5	5	5	5	5	44	63	62	9			

TABLE 11  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1977

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m <sup>3</sup>												
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
1	Total Suspended particulates	43.7	68.5	50.0	47.4	38.3	55.5	31.6	26.6	27.8	43.4	37.0	42.8	42.0
	Organics, Benzene Solubles	1.8	3.2	2.3	2.2	2.9	2.4	1.5	2.5	1.9	2.0	.5	2.4	2.13
	Sulfates	6.0	5.7	8.6	6.0	6.2	8.5	5.8	3.0	5.6	6.7	4.0	4.6	5.89
	Nitrates	1.63	2.48	1.84	2.19	1.58	1.49	1.47	.50	1.27	2.33	1.27	1.91	1.66
2	Total Suspended Particulates	41.3	47.5	49.6	37.0	36.0	40.8	23.0	21.6	20.8	30.6	30.4	24.8	33.6
	Organics, Benzene Solubles	1.8	3.7	1.0	2.1	1.7	1.4	2.2	1.4	1.3	1.1	.3	1.1	1.59
	Sulfates	5.1	4.9	7.6	7.5	6.9	8.0	3.9	2.3	3.0	7.6	4.3	3.4	5.38
	Nitrates	1.37	1.77	1.67	1.91	1.38	1.48	1.31	.52	.65	1.19	1.15	1.64	1.34
3	Total Suspended Particulates	31.3	42.8	43.0	33.8	25.4	33.3	25.2	27.0	19.8	35.6	25.8	24.8	30.4
	Organics, Benzene Solubles	1.4	3.4	2.3	2.1	1.8	2.4	.7	1.9	1.2	1.5	.6	1.3	1.72
	Sulfates	5.0	4.2	7.4	5.4	5.6	4.1	3.7	2.8	3.1	6.2	3.9	4.0	4.62
	Nitrates	1.61	1.95	1.92	2.11	1.54	1.65	1.29	.49	.75	1.38	1.26	1.75	1.48



TABLE 11 (cont.)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1977

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE $\mu\text{g}/\text{m}^3$												
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
4	Total Suspended Particulates	41.2	56.5	45.8	48.2	39.2	55.2	33.0	35.6	25.8	44.2	37.8	37.0	41.0
	Organics, Benzene Soluble	2.5	2.9	1.4	2.3	2.0	1.8	1.8	3.7	1.0	2.0	.6	3.2	2.10
	Sulfates	6.4	6.1	8.5	7.8	7.4	8.0	4.8	3.1	3.2	6.8	4.0	3.9	5.83
	Nitrates	1.57	2.32	1.94	2.34	1.82	1.73	1.33	.61	1.22	1.87	1.23	2.06	1.67
5	Total Suspended Particulates	36.5	47.8	51.6	48.2	40.3	47.8	32.2	31.4	26.5	43.2	32.0	33.4	39.1
	Organics, Benzene Soluble	1.5	3.7	1.5	1.8	2.1	1.9	1.2	2.9	1.3	1.2	1.2	2.6	1.91
	Sulfates	4.7	5.5	8.1	7.6	7.1	8.1	6.0	3.2	3.6	6.6	5.2	3.7	5.78
	Nitrates	1.41	2.26	1.96	2.28	1.92	1.72	1.29	.55	1.10	1.90	1.38	2.00	1.65
6	Total Suspended Particulates	43.0	51.0	45.8	46.2	36.5	48.5	34.8	32.4	26.6	43.8	30.2	38.0	39.3
	Organics, Benzene Soluble	1.6	3.1	.7	2.8	2.3	1.5	2.2	1.3	1.1	1.1	1.1	2.7	1.79
	Sulfates	6.1	5.6	7.9	6.3	6.0	7.9	4.3	3.2	3.1	6.7	4.7	4.4	5.52
	Nitrates	1.65	2.06	1.75	2.01	1.54	1.53	1.20	.62	.80	1.92	1.23	2.39	1.56

TABLE 11 (cont.)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1977

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE $\mu\text{g}/\text{m}^3$													
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL	
7	Total Suspended Particulates	25.5	31.8	34.0	30.6	24.8	35.0	18.8	18.4	13.0	26.2	21.2	16.0	24.3	
	Organics, Benzene Solubles	1.1	2.1	1.0	1.6	1.7	1.0	1.4	1.3	1.4	.4	.5	1.6	1.26	
	Sulfates	5.8	4.4	7.2	5.5	5.7	6.4	3.0	2.2	2.1	6.6	2.9	3.7	4.62	
	Nitrates	1.65	1.82	1.73	2.05	1.37	1.64	1.14	.60	.64	1.13	1.16	1.46	1.37	
8	Total Suspended Particulates	57.5	88.0	89.4	89.0	53.3	55.2	42.0	40.8	32.8	58.0	67.0	59.4	59.0	
	Organics, Benzene Solubles	2.0	2.9	2.6	2.6	1.9	2.4	2.2	1.6	1.4	1.6	1.8	3.7	2.22	
	Sulfates	6.2	5.8	7.7	6.1	6.6	5.7	3.0	2.3	3.2	7.1	4.8	4.7	5.27	
	Nitrates	1.67	2.38	2.28	2.04	1.55	1.53	1.37	.70	.81	1.66	2.10	1.48	1.63	
9	Total Suspended Particulates	28.2													
	Organics, Benzene Solubles	1.8													
	Sulfates	4.8													
	Nitrates	1.37													

TABLE 11 (cont.)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1977

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m <sup>3</sup>												
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
10	Total Suspended Particulates	48.8	61.5	48.6	43.4	34.8	53.8	33.4	29.6	32.4	47.8	35.2	34.4	41.4
	Organics, Benzene Solubles	3.4	3.3	1.6	2.3	2.2	2.5	2.4	3.2	2.1	2.9	1.9	2.9	2.56
	Sulfates	5.0	4.7	7.3	7.2	6.0	6.9	3.5	2.3	2.9	6.1	2.8	3.9	4.88
	Nitrates	1.53	1.95	1.84	2.22	1.52	1.60	1.28	.58	.81	1.29	1.05	1.54	1.43
12	Total Suspended Particulates	31.3	43.5	39.0	35.6	26.2	37.2	25.8	21.6	20.2	30.0	24.0	26.0	29.8
	Organics, Benzene Solubles	1.1	3.9	.8	1.8	1.4	1.3	1.0	2.9	2.4	1.4	.9	2.2	1.76
	Sulfates	6.6	5.6	8.2	6.8	6.0	6.1	3.9	3.0	4.7	7.7	4.0	3.7	5.52
	Nitrates	1.49	2.14	1.70	1.96	1.58	1.05	1.11	.53	.69	1.42	1.24	1.44	1.36
16	Total Suspended Particulates	31.5	52.0	47.0	38.8	30.8	36.2	25.4	19.0	18.2	28.2	24.6	19.2	30.9
	Organics, Benzene Solubles	2.0	2.1	1.4	3.0	1.6	1.0	.4		2.4	1.3	.7	1.4	1.57
	Sulfates	5.7	5.2	8.4	6.4	6.6	7.6	3.1		3.9	5.7	3.0	3.0	5.33
	Nitrates	1.71	2.44	1.99	2.28	1.70	1.83	.77		.86	1.31	1.34	1.35	1.60



TABLE 11 (cont.)  
MONTHLY AVERAGE CONTENT - SUSPENDED PARTICULATE - 1977

SITE NO.	ITEMS MEASURED	ARITHMETIC AVERAGE ug/m <sup>3</sup>												
		J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
17	Total Suspended Particulates	30.8	29.5	54.2	56.8	46.8	47.0	25.4	24.8	22.0	31.4	34.0	19.4	34.6
	Organics, Benzene Solubles	.7	2.6	2.2	2.3	2.9	2.4	1.5	1.3	1.6	1.2	.5	1.2	1.70
	Sulfates	6.3	6.8	7.5	6.5	7.5	7.5	3.0	2.7	4.1	6.2	4.3	3.2	5.47
	Nitrates	1.89	2.41	1.94	2.30	1.96	2.08	1.06	.58	.70	.92	2.09	1.50	1.62
18	Total Suspended Particulates				48.4	38.0	40.0	26.8	29.2	22.4	32.0	40.0	17.0	
	Organics, Benzene Solubles				2.3	2.5	1.2	.8	2.2	.9	.2	1.5	1.2	
	Sulfates				5.5	8.3	7.4	2.9	1.9	3.0	6.6	3.4	3.4	
	Nitrates				1.97	1.87	1.71	1.30	.55	.62	1.27	1.59	1.46	



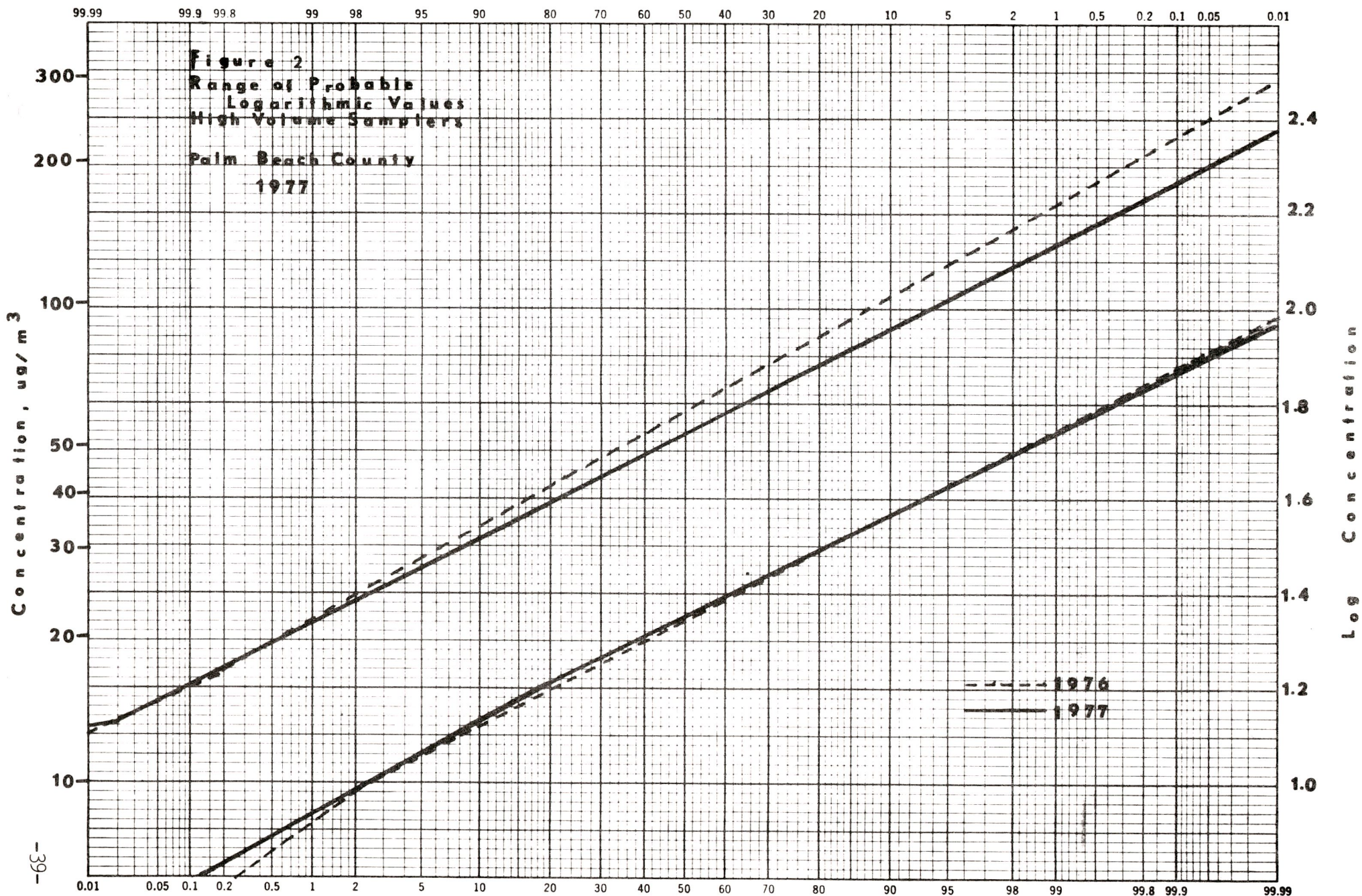




TABLE 12  
TOTAL SUSPENDED PARTICULATE  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR								
		1969	1970	1971	1972	1973	1974	1975	1976	1977
1	Maximum	109.3	115.7	121.1	133.6	101.9	96.4	81.5	106.2	172.0
	Minimum	9.6	13.9	15.2	15.2	10.8	19.6	20.0	15.8	17.0
	Arithmetic Mean	48.7	40.9	58.7	49.9	40.5	40.9	44.7	37.4	42.0
	Geometric Mean	43.9	39.5	53.4	45.9	38.0	38.8	42.4	35.3	38.3
	Geometric Std. Deviation	1.56	1.42	1.19	1.49	1.49	1.38	1.39	1.41	1.50
2	Maximum	71.2	74.3	122.3	112.3	85.4	104.0	77.7	63.1	74.0
	Minimum	7.3	13.3	10.7	12.2	5.3	19.6	11.9	14.0	12.0
	Arithmetic Mean	26.9	30.4	34.6	33.0	33.6	32.4	36.4	35.5	33.6
	Geometric Mean	24.6	28.3	30.8	30.3	31.4	30.6	34.1	33.4	30.9
	Geometric Std. Deviation	1.51	1.45	1.61	1.48	1.49	1.36	1.45	1.44	1.50
3	Maximum	71.8	82.3	167.5	94.8	133.2	132.7	91.8	67.8	62.0
	Minimum	7.7	1.3	0.4	12.8	16.6	16.1	14.6	10.3	11.0
	Arithmetic Mean	32.2	31.7	40.6	37.0	38.2	35.8	38.3	31.4	30.4
	Geometric Mean	29.5	28.4	30.7	33.7	35.3	32.2	34.5	29.1	28.4
	Geometric Std. Deviation	1.63	1.76	2.93	1.49	1.47	1.54	1.61	1.50	1.45
4	Maximum	351.9	224.8	95.6	89.8	85.6	196.8	435.3	81.0	84.0
	Minimum	7.3	8.0	10.2	12.9	13.3	18.3	19.6	12.7	14.0
	Arithmetic Mean	32.9	30.9	37.2	34.8	37.7	45.2	57.1	38.2	41.0
	Geometric Mean	26.4	28.2	31.7	32.3	35.3	38.8	47.9	35.8	39.1
	Geometric Std. Deviation	1.78	1.47	1.85	1.49	1.39	1.67	1.64	1.44	1.38
5	Maximum	164.9	76.7	142.4	108.0	92.9	81.9	83.5	61.1	81.0
	Minimum	13.3	8.3	12.2	15.9	10.9	13.8	22.0	13.8	18.0
	Arithmetic Mean	40.1	36.2	36.4	38.5	40.0	34.8	42.0	35.8	39.1
	Geometric Mean	38.8	33.6	32.0	35.4	37.6	32.2	39.5	34.0	37.0
	Geometric Std. Deviation	1.47	1.49	1.64	1.49	1.46	1.53	1.41	1.40	1.41



TABLE 12 (cont.)  
TOTAL SUSPENDED PARTICULATE,  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR									
		1969	1970	1971	1972	1973	1974	1975	1976	1977	
6	Maximum	83.1	80.1	237.9	275.3	106.5	92.4	114.8	62.8	79.0	
	Minimum	9.5	9.6	13.3	17.0	13.6	20.9	22.4	16.4	15.0	
	Arithmetic Mean	36.4	33.5	49.1	44.9	43.1	41.6	45.4	35.6	39.3	
	Geometric Mean	32.9	31.0	41.1	39.9	40.2	38.4	42.7	33.8	37.0	
	Geometric Std. Deviation	1.60	1.48	2.09	1.56	1.46	1.26	1.43	1.38	1.43	
7	Maximum	52.5	71.7	131.5	102.0	65.5	98.3	70.5	55.2	64.0	
	Minimum	7.2	2.1	1.6	7.0	9.1	5.4	11.4	6.2	9.0	
	Arithmetic Mean	23.6	25.8	30.7	31.8	28.1	25.6	33.0	23.1	24.3	
	Geometric Mean	21.5	23.3	24.4	28.3	26.2	22.3	30.4	21.0	22.5	
	Geometric Std. Deviation	1.57	1.59	2.13	1.37	1.45	1.66	1.52	1.55	1.49	
8	Maximum	175.7	273.9	222.7	173.3	151.0	210.9	199.4	125.2	149.0	
	Minimum	12.7	14.5	12.6	19.8	20.3	22.8	10.7	12.6	17.0	
	Arithmetic Mean	53.8	54.6	61.4	58.6	59.8	59.8	62.4	61.6	59.0	
	Geometric Mean	46.0	47.1	53.1	52.3	54.0	54.2	56.7	56.3	54.6	
	Geometric Std. Deviation	1.76	1.70	1.64	1.60	1.61	1.57	1.56	1.56	1.49	
9	Maximum				74.50	145.3	81.2	65.3	59.1	33.0	
	Minimum				13.30	11.7	11.3	16.1	9.6	20.0	
	Arithmetic Mean				31.2	33.2	29.9	34.1	28.2		
	Geometric Mean				28.7	30.7	27.0	32.2	26.3		
	Geometric Deviation				1.42	1.45	1.50	1.39	1.46		
10	Maximum				94.80	109.0	113.0	81.7	101.6	98.0	
	Minimum				18.30	19.0	21.0	23.4	12.8	19.0	
	Arithmetic Mean				44.4	45.3	43.0	47.2	42.8	41.4	
	Geometric Mean				41.6	42.5	39.0	45.4	40.5	39.2	
	Geometric Std. Deviation				1.43	1.43	1.54	1.35	1.40	1.40	

TABLE 12 (cont.)  
TOTAL SUSPENDED PARTICULATE  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR								
		1969	1960	1971	1972	1973	1974	1975	1976	1977
11	Maximum				69.9	77.8	134.3	299.9	60.8	
	Minimum				11.9	11.5	13.5	13.5	10.9	
	Arithmetic Mean				32.1	30.8	34.4	44.9		
	Geometric Mean				29.2	28.9	29.4	37.7		
	Geometric Std. Deviation				1.51	1.53	1.70	1.67		
12	Maximum				68.1	79.6	200.7	64.9	53.7	66.0
	Minimum				11.2	11.0	12.8	18.2	6.0	14.0
	Arithmetic Mean				29.6	31.6	34.9	34.2	26.9	29.8
	Geometric Mean				26.9	29.6	29.2	32.4	25.1	27.9
	Geometric Std. Deviation				1.54	1.43	1.70	1.39	1.47	1.43
16	Maximum								130.1	76.0
	Minimum								14.6	12.0
	Arithmetic Mean								35.0	30.9
	Geometric Mean								31.0	28.2
	Geometric Std. Deviation								1.60	1.52
17	Maximum									69.0
	Minimum									10.0
	Arithmetic Mean									34.6
	Geometric Mean									31.6
	Geometric Std. Deviation									1.53
18	Maximum									63.0
	Minimum									9.0
	Arithmetic Mean									
	Geometric Mean									
	Geometric Std. Deviation									

TABLE 13  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR								
		1969	1970	1971	1972	1973	1974	1975	1976	1977
1	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	48.7 3.3 4.1 0.8	40.9 3.8 3.2 0.7	58.7 4.7 3.6 1.2	49.6 2.4 3.7 0.9	40.5 2.0 2.9 1.0	40.9 2.4 2.7 0.9	44.7 2.6 4.8 1.7	37.4 2.6 5.4 1.6	42.0 2.1 5.9 1.7
2	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	26.9 1.6 3.6 0.6	30.4 1.6 4.2 0.6	34.6 4.0 3.2 0.8	33.0 1.0 3.5 0.8	33.6 1.3 3.0 1.0	32.4 2.4 3.7 1.0	36.4 2.6 4.4 1.8	35.5 2.3 4.8 1.5	33.6 1.6 5.4 1.3
3	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	32.2 3.9 2.4 0.7	31.7 4.4 3.4 0.7	40.6 4.8 3.2 0.9	37.0 1.2 3.1 0.8	38.2 1.8 3.5 1.1	35.8 2.2 3.4 0.9	38.3 2.2 5.2 1.7	31.4 2.2 5.3 1.7	30.4 1.7 4.6 1.5
4	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	32.9 1.5 3.3 0.7	30.9 1.7 3.2 0.8	37.2 3.3 3.1 1.0	34.8 1.2 3.6 0.7	37.7 1.5 3.0 1.2	45.2 2.2 2.6 0.9	57.1 2.5 4.7 1.6	38.2 2.7 5.7 1.8	41.0 2.1 5.8 1.7
5	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	40.1 2.8 3.9 0.8	36.2 2.9 4.1 0.8	36.4 3.5 2.8 0.9	38.5 1.0 3.5 0.8	40.0 1.5 3.1 1.1	34.8 2.6 3.0 0.8	42.0 2.2 4.0 1.5	35.8 2.4 5.0 1.6	39.1 1.9 5.8 1.6
6	Total Suspended Particulate Organics, Benzene Soluble Sulfates Nitrates	36.4 1.6 3.9 0.7	33.5 2.4 3.2 0.8	49.1 3.2 2.9 0.9	44.9 1.1 3.0 0.8	43.1 1.6 3.6 1.3	41.6 2.1 3.2 0.9	45.4 2.6 4.2 1.8	35.6 2.5 5.1 1.6	39.3 1.8 5.5 1.6



TABLE 13  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR						
		1969	1970	1971	1972	1973	1974	1975
7	Total Suspended Particulate	23.6	25.8	30.7	31.8	28.1	25.6	33.0
	Organics, Benzene Soluble	1.6	2.3	4.2	0.8	1.6	2.6	2.5
	Sulfates	3.4	3.6	2.2	3.0	2.7	2.8	4.5
	Nitrates	0.7	0.8	0.9	0.8	1.1	0.9	1.6
8	Total Suspended Particulate	53.8	54.6	61.4	58.6	59.8	59.8	62.4
	Organics, Benzene Soluble	2.8	3.6	5.6	2.0	3.2	4.0	3.0
	Sulfates	4.2	4.1	3.3	3.4	4.0	4.8	5.7
	Nitrates	0.8	1.0	1.2	1.1	1.4	1.0	1.8
9	Total Suspended Particulate	31.2	1.3	2.8	0.8	33.2	29.9	34.1
	Organics, Benzene Soluble	1.3	1.3	2.9	1.1	2.2	2.8	4.6
	Sulfates	2.8	2.8	2.9	2.8	2.2	4.6	2.0
	Nitrates	0.8	0.8	1.1	0.9	1.5	1.5	1.5
10	Total Suspended Particulate	44.4	45.3	43.0	47.2	42.8	41.4	41.4
	Organics, Benzene Soluble	1.2	2.8	3.2	4.2	3.6	3.4	2.6
	Sulfates	2.5	3.1	2.7	4.2	4.8	4.9	1.4
	Nitrates	0.8	1.0	0.8	1.3	1.5	1.4	1.4
11	Total Suspended Particulate	32.1	30.8	34.4	34.9	44.9	44.9	44.9
	Organics, Benzene Soluble	2.1	1.8	2.4	3.5	3.9	1.4	1.4
	Sulfates	2.9	2.6	2.8	3.9	3.5	3.9	3.5
	Nitrates	0.8	1.1	0.8	1.4	1.4	1.4	1.4
12	Total Suspended Particulate	29.6	31.6	34.9	34.2	26.9	29.8	29.8
	Organics, Benzene Soluble	1.4	1.3	2.7	2.5	1.8	1.8	1.8
	Sulfates	2.7	3.6	3.1	4.8	5.5	5.5	5.5
	Nitrates	0.8	1.0	0.7	1.7	1.5	1.4	1.4

TABLE 13  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR								
		1969	1970	1971	1972	1973	1974	1975	1976	1977
16	Total Suspended Particulate								35.0	30.9
	Organics, Benzene Soluble								2.7	1.6
	Sulfates								4.3	5.3
	Nitrates								1.8	1.6
17	Total Suspended Particulate									34.6
	Organics, Benzene Soluble									1.7
	Sulfates									5.5
	Nitrates									1.6

TABLE 14  
GASEOUS SAMPLING  
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.

SITE NO.	SAMPLING DATES	1 HOUR	SULFUR DIOXIDE		TOTAL OXIDANTS		O <sub>3</sub>	1 HOUR	8 HOUR
			3 HOUR	24 HOUR	1 HOUR	8 HOUR			
1	7/17-7/31/70	0.094	0.038	0.007	0.114	0.073			
	4/12-4/27/71	0.044	0.028	>0.006	>0.188	>0.130			
	7/16-7/30/71	0.035	0.012	0.002	0.032	0.026			
	11/14-12/31/72	0.023	0.021	0.003	>0.187	>0.040			
	1/1-11/14/73	0.042	0.034	0.004					
	11/14-12/31/73	0.015	0.008	0.001					
	1/1-11/1/73				0.155	0.063			
	9/6-12/31/73						>0.100	>0.071	
	1/1-12/31/74	0.075	0.052	0.023			0.077	0.055	
	1/1-12/31/75	0.062	0.025	0.008			0.104	0.077	
	1/1-12/31/76	0.055	0.034	0.021			0.148	0.122	
	1/1-12/31/77	0.019	0.015	0.009			0.106	0.088	
2	6/16-7/2/70	0.035	0.026	0.010	0.104	0.093			
	5/11-5/25/71	0.191	0.142	0.028	0.010	0.0004			
	8/13-8/27/71	0.033	0.015	0.003	0.016	0.018			
3	7/2-7/17/70	0.196	0.128	0.028	0.176	0.086			
	4/27-5/11/71	>0.500	0.324	0.060	0.111	0.055			
	7/30-8/13/71	0.064	0.035	0.005	0.007	0.001			
	5/18-6/30/72	0.053	0.032	0.006	0.116	0.071			
	9/3-12/31/76			0.004					
	1/1-12/31/77			0.004					
4	7/31-8/14/70	0.031	0.024	0.010	0.129	0.089			
	3/26-4/12/71	0.044	0.034	0.012	0.110	0.106			
	9/23-10/4/71	0.080	0.035	0.006	0.056	0.048			
	11/10-11/19/71	0.000	0.000	0.000	0.078	0.073			
5	9/4-9/18/70	0.069	0.029	0.003	0.092	0.066			
	3/12-3/26/71	0.060	0.028	0.005	0.013	0.086			
	10/19-11/1/71	0.006	0.002	0.0003	0.136	0.101			



TABLE 14 (CONTD.)  
GASEOUS SAMPLING  
MAXIMUM AMBIENT AIR CONCENTRATIONS, PPM.

SITE NO.	SAMPLING DATES	1 HOUR	SULFUR DIOXIDE		TOTAL OXIDANTS		O <sub>3</sub>	
			3 HOURS	24 HOUR	1 HOUR	8 HOUR	1 HOUR	8 HOUR
6	8/21-9/4/70	0.076	0.048	0.013	0.048	0.037		
	1/27-2/12/71	0.132	0.098	0.017	0.110	0.095		
	12/29-1/12/72	0.068	0.034	0.006	0.000	0.000		
	7/5-8/1/72	0.015	0.012	0.003	0.050	0.027		
7	9/28-10/12/70	0.106	0.048	0.006	0.076	0.068		
	2/26-3/12/71	0.026	0.008	>0.003	0.110	0.093		
	11/19-12/10/71	0.015	0.006	0.001	0.038	0.016		
8	10/12-10/26/70	0.000	0.000	0.000	0.078	0.061		
	2/12-2/26/71	>0.288	0.125	>0.030	0.103	0.076		
	2/10-12/29/71	>0.267	0.217	>0.039	0.012	0.006		
	9/21/72-5/1/73	0.068	0.028	0.007				
	12/1/72-5/18/73	0.176	0.098	0.044				
	12/18-12/31/73	0.153	0.113	0.025				
	1/1-9/27/74	0.065	0.031	0.004				
	7/8-12/31/75	0.075	0.074	0.029				
	1/1-12/31/76	0.085	0.078	0.051				
	1/1-12/31/77	0.033	0.029	0.016				
17	9/27-12/31/76			0.003				
	1/1-12/31/77			0.003				

TABLE 14 (CONTD.)  
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.

SITE NO.	SAMPLING DATES	NO <sub>2</sub>			CO		HC	
		1 HOUR	8 HOUR	AR./MEAN	1 HOUR	8 HOUR	1 HOUR	8 HOUR
1	7/17-7/31/70	0.097	0.068	0.016				
	4/12-4/27/71	0.147	0.079	0.026				
	7/16-7/30/71	0.067	0.056	0.018	3.6	3.1		
	11/14-12/31/72	0.092	0.079	0.020	7.0	3.7	6.5	3.2
	1/1-11/15/73	0.060	0.047	0.007				
	1/1-12/31/73				8.9	6.3	5.5	3.3
	1/1-12/31/74	0.080	0.052	0.015	10.5	8.8	5.8	4.4
	1/1-12/31/75	0.125	0.083	0.015	8.6	5.0	5.2	3.0
	1/1-12/31/76	0.083	0.054	0.009	10.5	5.2	5.3	3.7
	1/1-12/31/77	0.071	0.044	0.017	11.8	8.5	5.2	3.6
2	6/16-7/2/70	0.044	0.032	0.010				
	5/11-5/25/71	0.054	0.040	0.013	2.2	0.3		
	8/12-8/27/71	0.073	0.060	0.013	0.0	0.0		
3	7/2-7/17/70	0.084	0.060	0.010				
	4/27-5/11/71	0.096	0.066	0.017				
	7/30-8/13/71	0.083	0.069	0.018	3.2	0.9		
	5/18-6/30/72	0.088	0.059	0.010	0.0	0.0	3.2	2.2
	1/1-12/31/76			0.006				
	1/1-12/31/77			0.010				
4	7/31-8/14/70	0.097	0.068	0.016				
	3/26-4/12/71	0.118	0.107	0.018	2.1	0.3		
	9/23-10/4/71	0.059	0.041	0.018	0.0	0.0		
	11/10-11/19/71	0.124	0.101	0.020	0.0	0.0		
5	9/4-9/18/70	0.055	0.051	0.013				
	3/12-3/26/71	0.146	0.113	0.018	2.1	0.4		
	10.19-11/1/71	0.117	0.093	0.029				

TABLE 14 (CONTD.)  
MAXIMUM AMBIENT AIR CONCENTRATION, PPM.

SITE NO.	SAMPLING DATES	NO <sub>2</sub>			CO		HC	
		1 HOUR	8 HOUR	AR./MEAN	1 HOUR	8 HOUR	1 HOUR	8 HOUR
6	8/21-9/4/70	0.064	0.048	0.015				
	1/27-2/12/71	>0.200	>0.187	0.047	9.6	4.2		
	12/29-1/12/71	0.079	0.069	0.022	2.6	0.4		
	7/5-8/1/72	0.065	0.055	0.011				
7	9/28-10/12/71	0.031	0.018	0.007				
	2/26-3/12/71	0.106	0.081	0.016	0.8	0.1		
	11/9-12/10/71	0.074	0.055	0.019	2.2	2.0		
8	10/12-10/26/70	0.118	0.067	0.017				
	2/12-2/26/71	0.152	0.091	0.022	5.2	3.0		
	12/10-12/29/71	0.076	0.048	0.024	0.0	0.0		
13	11/14-12/31/73			0.003				
	1/1-12/31/74			0.004				
	1/1-12/31/75			0.008				
	1/1-12/31/76			0.005				
	1/1-12/31/77			0.008				
14	11/14-12/31/73			0.004				
	1/1-12/31/74			0.005				
	1/1-12/31/75			0.012				
	1/1-12/31/76			0.008				
	1/1-12/31/77			0.015				



TABLE 15  
NITROGEN DIOXIDE DATA  
SITE NUMBER 1  
1977

<u>MONTH</u>	<u>HOURS</u>	<u>ARITH. (a)</u> <u>AVG., ppm</u>	<u>MAX. 24 HR.</u> <u>AVG., ppm</u>
J	0		
F	0		
M	310	0.020	0.031
A	296	0.014	0.019
M	0		
J	0		
J	0		
A	0		
S	0		
O	0		
N	0		
D	0		
ANNUAL	606	0.017	0.031

(a) Standard is 0.05 ppm, annual arithmetic mean.

TABLE 16  
 AMBIENT AIR - NITROGEN DIOXIDE, PPM  
 SITE NUMBER 1  
 1977

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	ANNUAL
1 Hr. Maximum	0.071	0.046			0.071
8 Hr. Maximum	0.044	0.025			0.044
24 Hr. Maximum	0.031	0.019			0.031
Arithmetic Mean	0.020	0.014			0.017

Concentration Range	Hours				%	CUM %
< 0.010	17	40			57	9.41
0.010-0.019	180	220			400	66.01
0.020-0.029	62	30			92	15.18
0.030-0.039	35	5			40	6.60
0.040-0.049	6	1			7	1.16
0.050-0.059	3				3	.50
0.060-0.069	4				4	.66
0.070-0.079	3				3	.50
TOTAL	310	296	0	0	606	6.92
TOTAL DOWNTIME	1850	1888	2208	2208	8154	93.08
TOTAL TIME at SITE	2160	2184	2208	2208	8760	100.00

TABLE 17  
MANUAL SAMPLING, 1977  
NITROGEN DIOXIDE,  $\mu\text{g}/\text{m}^3$

<u>SITE</u>	<u>NO. OF SAMPLES</u>	<u>ARITH. AVG. (a)</u>	<u>24 HR. MAX.</u>
3	59	18	54
13	54	16	52
14	55	29	70

(a) Standard is  $100 \mu\text{g}/\text{m}^3$  Annual Arithmetic Mean.



TABLE 18  
NO<sub>2</sub> BUBBLER

SITE NUMBER 3  
1977

Concentrations = ug/m<sup>3</sup>

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	6	3	5	5	6	4	5	5	5	5	5	5	59
Maximum	38	46	33	23	34	26	18	26	32	54	30	32	54
Second Maximum	21	20	25	19	27	18	10	20	26	43	24	31	46
A. Mean (a)	19	26	17	13	14	18	11	15	19	27	17	27	18
Stand Dev.	12	18	12	8	13	5	4	9	10	23	11	5	12

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean

TABLE 12 (cont.)  
TOTAL SUSPENDED PARTICULATE ug/m<sup>3</sup>

SITE NO.	PARAMETER	YEAR								
		1969	1960	1971	1972	1973	1974	1975	1976	1977
11	Maximum				69.9	77.8	134.3	299.9	60.8	
	Minimum				11.9	11.5	13.5	13.5	10.9	
	Arithmetic Mean				32.1	30.8	34.4	44.9		
	Geometric Mean				29.2	28.9	29.4	37.7		
	Geometric Std. Deviation				1.51	1.53	1.70	1.67		
12	Maximum				68.1	79.6	200.7	64.9	53.7	66.0
	Minimum				11.2	11.0	12.8	18.2	6.0	14.0
	Arithmetic Mean				29.6	31.6	34.9	34.2	26.9	29.8
	Geometric Mean				26.9	29.6	29.2	32.4	25.1	27.9
	Geometric Std. Deviation				1.54	1.43	1.70	1.39	1.47	1.43
16	Maximum								130.1	76.0
	Minimum								14.6	12.0
	Arithmetic Mean								35.0	30.9
	Geometric Mean								31.0	28.2
	Geometric Std. Deviation								1.60	1.52
17	Maximum									69.0
	Minimum									10.0
	Arithmetic Mean									34.6
	Geometric Mean									31.6
	Geometric Std. Deviation									1.53
18	Maximum									63.0
	Minimum									9.0
	Arithmetic Mean									
	Geometric Mean									
	Geometric Std. Deviation									

TABLE 13  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR								
		1969	1970	1971	1972	1973	1974	1975	1976	1977
1	Total Suspended Particulate	48.7	40.9	58.7	49.6	40.5	40.9	44.7	37.4	42.0
	Organics, Benzene Soluble	3.3	3.8	4.7	2.4	2.0	2.4	2.6	2.6	2.1
	Sulfates	4.1	3.2	3.6	3.7	2.9	2.7	4.8	5.4	5.9
	Nitrates	0.8	0.7	1.2	0.9	1.0	0.9	1.7	1.6	1.7
2	Total Suspended Particulate	26.9	30.4	34.6	33.0	33.6	32.4	36.4	35.5	33.6
	Organics, Benzene Soluble	1.6	1.6	4.0	1.0	1.3	2.4	2.6	2.3	1.6
	Sulfates	3.6	4.2	3.2	3.5	3.0	3.7	4.4	4.8	5.4
	Nitrates	0.6	0.6	0.8	0.8	1.0	1.0	1.8	1.5	1.3
3	Total Suspended Particulate	32.2	31.7	40.6	37.0	38.2	35.8	38.3	31.4	30.4
	Organics, Benzene Soluble	3.9	4.4	4.8	1.2	1.8	2.2	2.2	2.2	1.7
	Sulfates	2.4	3.4	3.2	3.1	3.5	3.4	5.2	5.3	4.6
	Nitrates	0.7	0.7	0.9	0.8	1.1	0.9	1.7	1.7	1.5
4	Total Suspended Particulate	32.9	30.9	37.2	34.8	37.7	45.2	57.1	38.2	41.0
	Organics, Benzene Soluble	1.5	1.7	3.3	1.2	1.5	2.2	2.5	2.7	2.1
	Sulfates	3.3	3.2	3.1	3.6	3.0	2.6	4.7	5.7	5.8
	Nitrates	0.7	0.8	1.0	0.7	1.2	0.9	1.6	1.8	1.7
5	Total Suspended Particulate	40.1	36.2	36.4	38.5	40.0	34.8	42.0	35.8	39.1
	Organics, Benzene Soluble	2.8	2.9	3.5	1.0	1.5	2.6	2.2	2.4	1.9
	Sulfates	3.9	4.1	2.8	3.5	3.1	3.0	4.0	5.0	5.8
	Nitrates	0.8	0.8	0.9	0.8	1.1	0.8	1.5	1.6	1.6
6	Total Suspended Particulate	36.4	33.5	49.1	44.9	43.1	41.6	45.4	35.6	39.3
	Organics, Benzene Soluble	1.6	2.4	3.2	1.1	1.6	2.1	2.6	2.5	1.8
	Sulfates	3.9	3.2	2.9	3.0	3.6	3.2	4.2	5.1	5.5
	Nitrates	0.7	0.8	0.9	0.8	1.3	0.9	1.8	1.6	1.6



TABLE 13  
ANNUAL AVERAGE CONTENT - SUSPENDED PARTICULATE  
ARITHMETIC AVERAGES  $\mu\text{g}/\text{m}^3$

SITE NO.	PARAMETER	YEAR									
		1969	1970	1971	1972	1973	1974	1975	1976	1977	
7	Total Suspended Particulate	23.6	25.8	30.7	31.8	28.1	25.6	33.0	23.1	24.3	
	Organics, Benzene Soluble	1.6	2.3	4.2	0.8	1.6	2.6	2.5	2.1	1.3	
	Sulfates	3.4	3.6	2.2	3.0	2.7	2.8	4.5	4.0	4.6	
	Nitrates	0.7	0.8	0.9	0.8	1.1	0.9	1.6	1.5	1.4	
8	Total Suspended Particulate	53.8	54.6	61.4	58.6	59.8	59.8	62.4	61.6	59.0	
	Organics, Benzene Soluble	2.8	3.6	5.6	2.0	2.5	3.2	3.0	2.5	2.2	
	Sulfates	4.2	4.1	3.3	3.4	4.0	4.0	4.8	5.7	5.6	
	Nitrates	0.8	1.0	1.2	1.1	1.4	1.0	1.8	1.9	1.6	
9	Total Suspended Particulate	31.2	1.3	2.8	0.8	33.2	29.9	34.1	28.2		
	Organics, Benzene Soluble	1.3	1.3	2.8	1.1	1.3	2.2	2.2	2.0		
	Sulfates	2.8	2.9	2.9	2.8	2.8	4.6	4.6	4.6		
	Nitrates	0.8	0.8	1.1	0.9	0.9	1.5	1.5	1.5		
10	Total Suspended Particulate	44.4	45.3	44.4	45.3	43.0	47.2	42.8	41.4		
	Organics, Benzene Soluble	1.2	2.8	3.2	2.7	3.6	4.2	3.4	2.6		
	Sulfates	2.5	3.1	3.1	2.7	4.2	4.8	4.8	4.9		
	Nitrates	0.8	1.0	0.8	0.8	1.3	1.5	1.5	1.4		
11	Total Suspended Particulate	32.1	30.8	34.4	32.1	34.4	44.9				
	Organics, Benzene Soluble	2.1	1.8	2.4	2.1	2.4	3.5				
	Sulfates	2.9	2.6	2.8	2.9	3.9	3.9				
	Nitrates	0.8	1.1	0.8	0.8	1.4					
12	Total Suspended Particulate	29.6	31.6	34.9	29.6	34.2	26.9				
	Organics, Benzene Soluble	1.4	1.3	2.7	1.4	2.5	1.8				
	Sulfates	2.7	3.6	3.1	2.7	4.8	4.8				
	Nitrates	0.8	1.0	0.7	0.8	1.7	1.5				

TABLE 19  
NO<sub>2</sub> BUBBLER - N<sub>8</sub>

SITE NUMBER 13  
1977

Concentrations = ug/m<sup>3</sup>

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	6	4	5	4	6	3	5	5	5	2	4	5	54
Maximum	39	39	19	18	24	23	23	21	41	4	32	52	52
Second Maximum	33	16	19	6	22	18	15	12	25	2	13	35	41
A. Mean (a)	22	18	11	8	13	18	10	11	20	3	16	33	16
Stand Dev.	13	15	7	7	10	6	9	6	14	1	11	13	12

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean.

TABLE 20  
NO<sub>2</sub> BUBBLER - N<sub>9</sub>  
SITE NUMBER 14

1977

Concentrations = ug/m<sup>3</sup>

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	4	4	5	4	6	5	5	5	4	3	5	5	55
Maximum	42	70	51	36	38	31	25	36	39	52	39	47	70
Second Maximum	33	30	37	32	32	30	24	30	31	39	32	42	52
A. Mean (a)	35	37	32	25	24	26	21	24	28	36	26	39	29
Stand. Dev.	5	22	14	11	12	5	4	10	11	18	10	6	12

(a) Standard is 100 ug/m<sup>3</sup> annual arithmetic mean



TABLE 21  
CARBON MONOXIDE DATA  
SITE NUMBER 1  
1977

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX ppm	NO. OF HOURS 1 HR. STANDARD (35 ppm) EXCEEDED	8 HR. MAX ppm	NO. OF TIMES 8 HR. STANDARD (9 ppm) EXCEEDED
J	0					
F	0					
M	306		3.2	0	1.6	0
A	404		5.0	0	3.6	0
M	559		11.8	0	8.5	0
J	663		11.4	0	8.0	0
J	659		11.4	0	5.4	0
A	164		1.2	0	0.6	0
S	257		3.9	0	1.9	0
O	638		4.0	0	1.7	0
N	692		7.1	0	3.5	0
D	722		3.6	0	2.1	0
ANNUAL	5064	1.3	11.8	0	8.5	0

TABLE 22  
 AMBIENT AIR, CARBON MONOXIDE, PPM  
 SITE NUMBER 1  
 1977

CONCENTRATION RANGE	1 Hr. Maximum	8 Hr. Maximum	Quarter				ANNUAL
			1	2	3	4	
2.0	3.2	1.6	11.8	8.5	11.4	7.1	11.8
2.0-2.4	6				5.4	3.5	8.5
2.5-2.9	1						
3.0-3.9	1						
4.0-4.9							
5.0-5.9							
6.0-6.9							
7.0-7.9							
8.0-8.9							
TOTAL	306	1854	1626	1128	2052	5064	57.81
TOTAL DOWNTIME					156	3696	42.19
TOTAL TIME at SITE	2160		2184	2208	2208	8760	

%  
 66.21  
 73.93  
 79.84  
 86.51  
 91.03  
 95.22  
 97.57  
 99.35  
 100.00

TABLE 23  
OZONE DATA  
SITE NUMBER 1  
1977

MONTH	HOURS	GEO. MEAN ppm	1 HR. MAX. ppm	NO. OF HOURS 1 HR. STANDARD (0.08 ppm) EXCEEDED
J	593		0.056	0
F	634		0.068	0
M	532		0.082	3
A	552		0.073	0
M	713		0.106	24
J	663		0.087	1
J	701		0.039	0
A	614		0.057	0
S	642		0.055	0
O	536		0.079	0
N	693		0.054	0
D	720		0.043	0
<b>ANNUAL</b>	7593	0.018	0.106	28



TABLE 24  
 AMBIENT - AIR - OZONE, PPM  
 SITE NUMBER 1  
 1977

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	ANNUAL
1 Hr. Maximum	0.082	0.106	0.057	0.079	0.106
8 Hr. Maximum	0.066	0.088	0.046	0.068	0.088
24 Hr. Maximum	0.067	0.080	0.031	0.050	0.080

Concentration Range	Hours				%	CUM %	
< 0.010	406	449	679	500	2034	26.79	26.79
0.010-0.019	310	287	1014	401	2012	26.50	53.29
0.020-0.029	281	330	171	431	1213	15.98	69.26
0.030-0.039	315	361	46	411	1133	14.92	84.18
0.040-0.049	278	260	36	134	708	9.32	93.51
0.050-0.059	116	149	11	46	322	4.24	97.75
0.060-0.069	36	52		18	106	1.40	99.14
0.070-0.079	14	15		8	37	0.49	99.63
0.080-0.089	3	14			17	0.22	99.86
0.090-0.099		7			7	0.09	99.94
0.100-0.109		4			4	0.05	100.00
TOTAL	1759	1928	1957	1949	7593	86.68	
TOTAL DOWNTIME	401	256	251	259	1167	13.32	
TOTAL TIME							
at SITE	2160	2184	2208	2208	8760		

TABLE 25  
TOTAL HYDROCARBONS DATA  
SITE NUMBER 1  
1977

<u>MONTH</u>	<u>HOURS</u>	<u>3 HR MAX, ppm</u> <u>(6 - 9 A.M.)</u>	<u>(a) MEAN, ppm</u>
J	706	2.3	2.1
F	641	2.7	2.0
M	659	2.5	2.1
A	584	1.8	1.7
M	663	2.3	1.8
J	685	2.3	1.9
J	707	2.1	1.8
A	721	2.6	1.8
S	444	2.6	2.0
O	660	3.2	2.1
N	666	2.5	2.1
D	0		
Annual	7136	3.2	1.9

(a) Standard is 0.24 ppm 3 hr. Maximum concentration, 6-9 A.M., not to be exceeded more than once a year. This standard is for hydrocarbons, methane corrected, and is not applicable to the values reported above.

TABLE 26  
 AMBIENT AIR - TOTAL HYDROCARBONS, PPM  
 SITE NUMBER I

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	ANNUAL		
1 Hr. Maximum	5.2	3.6	5.2	5.0	5.2		
8 Hr. Maximum	3.6	2.5	2.8	3.2	3.6		
24 Hr. Maximum	2.6	2.0	2.2	2.5	2.6		
3 Hr. Maximum							
6-9 AM	2.7	2.3	2.6	3.2	3.2		
Concentration Range						Hours	% CUM %
< 0.1							
0.1-0.5							
0.6-1.0							
1.1-1.5		49	2		51	0.71	0.71
1.6-2.0	1320	1693	1587	874	5474	76.71	77.42
2.1-2.5	582	158	211	341	1292	18.11	95.53
2.6-3.0	62	21	58	66	207	2.90	98.43
3.1-3.5	25	10	8	31	74	1.04	99.47
3.6-4.0	11	1	3	8	23	0.32	99.79
4.1-4.5			2	2	4	0.56	99.85
4.6-5.0	5			4	9	0.13	99.97
5.1-5.5	1		1		2	0.03	100.00
TOTAL	2006	1932	1872	1326	7136	81.14	
TOTAL DOWNTIME	154	252	336	882	1624	18.54	
TOTAL TIME							
at Site	2160	2184	2208	2208	8760		



TABLE 27  
SULFUR, DIOXIDE, DATA  
SITE NUMBER 1  
1977

MONTH	HOURS	ARITH MEAN ppm	1 HR. MAX. ppm	3 HR. MAX. ppm	#TIMES MAX. EXCEEDED (0.500 ppm)	24 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.100 ppm)
J	0						
F	0						
M	0						
A	247	0.004	0.019	0.015	0	0.007	0
M	627	0.004	0.014	0.014	0	0.009	0
J	600	0.003	0.011	0.011	0	0.008	0
J	273	0.002	0.014	0.006	0	0.004	0
A	0						
S	0						
O	564	0.004	0.013	0.012	0	0.009	0
N	583	0.002	0.012	0.008	0	0.005	0
D	102	0.003	0.009	0.009	0	0.003	0
ANNUAL	2996	0.003	0.019	0.015	0	0.009	0

TABLE 28  
 AMBIENT AIR - SULFUR DIOXIDE, PPM  
 SITE NUMBER 1  
 1977

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	ANNUAL		
1 Hr. Maximum		0.019	0.014	0.013	0.019		
3 Hr. Maximum		0.015	0.006	0.012	0.015		
24 Hr. Maximum		0.009	0.004	0.009	0.009		
Arithmetic Mean		0.004	0.002	0.003	0.003		
Concentration Range			Hours			%	CUM %
0.010		1419	272	1197	2888	96.40	96.40
0.010-0.014		50	1	52	103	3.44	99.83
0.015-0.019		5			5	0.17	100.00
0.020-0.024							
0.025-0.029							
0.030-0.034							
0.035-0.039							
0.040-0.044							
0.045-0.049							
0.050-0.054							
0.055-0.059							
0.060-0.064							
TOTAL	0	1474	273	1249	2996	34.20	
TOTAL DOWNTIME	2160	710	1935	959	5764	65.80	
TOTAL TIME	2160	2184	2208	2208	8760		

TABLE 29  
SULFUR DIOXIDE DATA  
SITE NUMBER 8  
1977

MONIH	HOURS	ARITH MEAN ppm	1 HR. MAX. ppm	3 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.500 ppm)	24 HR. MAX. ppm	# TIMES MAX. EXCEEDED (0.100 ppm)
J	591	0.004	0.020	0.019	0	0.011	0
F	192	0.007	0.020	0.018	0	0.011	0
M	173	0.007	0.023	0.022	0	0.010	0
A	304	0.010	0.027	0.025	0	0.014	0
M	439	0.010	0.033	0.027	0	0.013	0
J	222	0.010	0.030	0.029	0	0.016	0
J	333	0.005	0.025	0.023	0	0.007	0
A	329	0.003	0.020	0.015	0	0.006	0
S	456	0.003	0.014	0.010	0	0.005	0
O	0						
N	0						
D	220	0.005	0.020	0.019	0	0.008	0
ANNUAL	3259	0.006	0.033	0.029	0	0.016	0

TABLE 30  
 AMBIENT AIR - SULFUR DIOXIDE, PPM  
 SITE NUMBER 8  
 1977

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	ANNUAL
1 Hr. Maximum	0.023	0.033	0.025	0.020	0.033
3 Hr. Maximum	0.022	0.029	0.023	0.019	0.029
24 Hr. Maximum	0.011	0.016	0.014	0.008	0.016
Arithmetic Mean	0.006	0.010	0.007	0.005	0.006

Concentration Range	Hours					%	CUM%
< .010	763	491	1044	180	2478	76.04	76.04
0.010-0.014	138	249	58	18	463	14.21	90.24
0.015-0.019	46	142	12	21	221	6.78	97.02
0.020-0.024	9	62	3	1	75	2.30	99.32
0.025-0.029		18	1		19	0.58	99.91
0.030-0.034		3			3	0.09	100.00
TOTAL	956	965	1118	220	3259	37.20	
TOTAL DOWNTIME	1204	1219	1090	1988	5501	62.80	
TOTAL TIME at SITE	2160	2184	2208	2208	8760		



TABLE 31  
MANUAL SAMPLING, 1977  
SULFUR DIOXIDE,  $\mu\text{g}/\text{m}^3$

<u>SITE</u>	<u>NO. OF SAMPLES</u>	<u>ARITH. AVG.</u>	<u>24 HR. MAX.</u>
3	59	1	10
17	56	1	8

Standard:

Annual Arithmetic Mean =  $60 \mu\text{g}/\text{m}^3$

Maximum 24 Hr. Conc. =  $260 \mu\text{g}/\text{m}^3$

Maximum 3 Hr. Conc. =  $1,300 \mu\text{g}/\text{m}^3$

TABLE 32  
SO<sub>2</sub> BUBBLER

SITE NUMBER 3  
1977

Concentrations = ug/m <sup>3</sup>													
	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	5	4	5	5	6	5	5	5	5	4	5	5	59
Maximum	0	8	10	7	0	2	1	3	4	7	2	0	10
Second Maximum	0	0	0	0	0	2	1	0	0	1	1	0	7
A. Mean	0	2	2	1	0	1	0	1	1	2	1	0	1
Stand Dev.	0	4	4	3	0	1	1	1	2	4	1	0	2

Standard:

Annual Arithmetic Mean = 60 ug/m<sup>3</sup>

Maximum 24 Hr. Conc. = 260 ug/m<sup>3</sup>

Maximum 3 Hr. Conc. = 1,300 ug/m<sup>3</sup>

TABLE 33  
SO<sub>2</sub> BUBBLER

SITE NUMBER 17  
1977

Concentration = ug/m<sup>3</sup>

	J	F	M	A	M	J	J	A	S	O	N	D	ANNUAL
Number of Samples	5	2	4	5	6	5	5	5	5	4	5	5	56
Maximum	0	6	8	1	0	5	1	2	0	8	0	1	8
Second Maximum	0	0	2	1	0	4	1	0	0	5	0	0	8
A. Mean	0	3	3	0	0	2	0	0	0	3	0	0	1
Stand. Dev.	0	4	4	0	0	2	1	1	0	4	0	1	2

Standard:

Annual Arithmetic Mean = 60 ug/m<sup>3</sup>

Maximum 24 Hr. Conc. = 260 ug/m<sup>3</sup>

Maximum 3 Hr. Conc. = 1,300 ug/m<sup>3</sup>

VI  
POLLUTANT STANDARDS INDEX

A major area of concern for the Air Pollution Section of the Palm Beach County Health Department is how to best report daily air quality to the public. Public confusion can result in areas where neighboring States, counties and cities use different indices. The Environmental Protection Agency (EPA) has recommended that a standardized daily air quality reporting index be used by local and State agencies. This index is called the Pollutant Standards Index (PSI). This PSI is an indicator which reports five pollutants: total suspended particulate, carbon monoxide, sulfur dioxide, nitrogen dioxide, and photochemical oxidants (oxone). These five pollutants have been assigned National Ambient Air Quality Standards (NAAQS), Federal Episode Criteria, and Significant Harm Levels. The Palm Beach County Health Department samples for the above pollutants and has utilized the pollution standard index since April 28, 1976.

The index converts the actual air pollution concentration to a normalized number. For example, for each National Ambient Air Quality Standard a corresponding value for the Pollutant Standards Index would be 100. This approach is easier for the public to understand.

The PSI with the highest index value occurring in the day, its value, and a descriptor word are reported. Five descriptor words have been chosen to describe daily air quality: "good", "satisfactory", "unsatisfactory", "unhealthful" and "hazardous".

A typical air quality report for Palm Beach County would be:

Index is 31. The Ambient Air Quality is within the good range.

In addition, the index lists the problem pollutant, generalized health effects and provides cautionary statements if pollutant concentrations warrant.



Pollutants are monitored at the West Palm Beach Monitoring Site.

Adoption of PSI by many pollution control organizations has reduced the confusion due to the existence of many indices. PSI has several advantages: 1) it is simple and can be easily understood by the public, 2) it can accommodate new pollutants, 3) it is based on a reasonable scientific premise, 4) it relates to National Ambient Air Quality Standard, Federal Episode Criteria, and Significant Harm Levels, and 5) it exhibits day to day variations.

Pollutant Standards Index advisories are issued to local news papers, television and radio stations each morning and afternoon Monday thru Friday. Figures 3 and 4 show daily plots of the P.S.I. for the year 1977. Table 34 gives a statistical analysis of the monthly morning and afternoon values. Of the 20 morning and 46 afternoon P.S.I's which exceeded the good category, two daily values were due to suspended particulate concentrations. All others reflected ozone concentrations.

TABLE 34  
POLLUTION STANDARD INDEX  
WEST PALM BEACH  
1977

MONTH	DAYS	A.M. VALUES			
	Good	Satisfactory	MAXIMUM	MINIMUM	MEAN
Year	232	20	94	6	27
Jan.	19	1	56	9	29
Feb.	18	2	64	12	33
March	20	3	57	14	36
April	13	8	71	20	47
May	16	5	94	11	40
June	22		50	8	23
July	20		40	8	16
Aug.	23		22	8	12
Sept.	21		28	6	13
Oct.	21	1	41	8	26
Nov.	18		51	10	25
Dec.	21		46	12	27
SD.					17

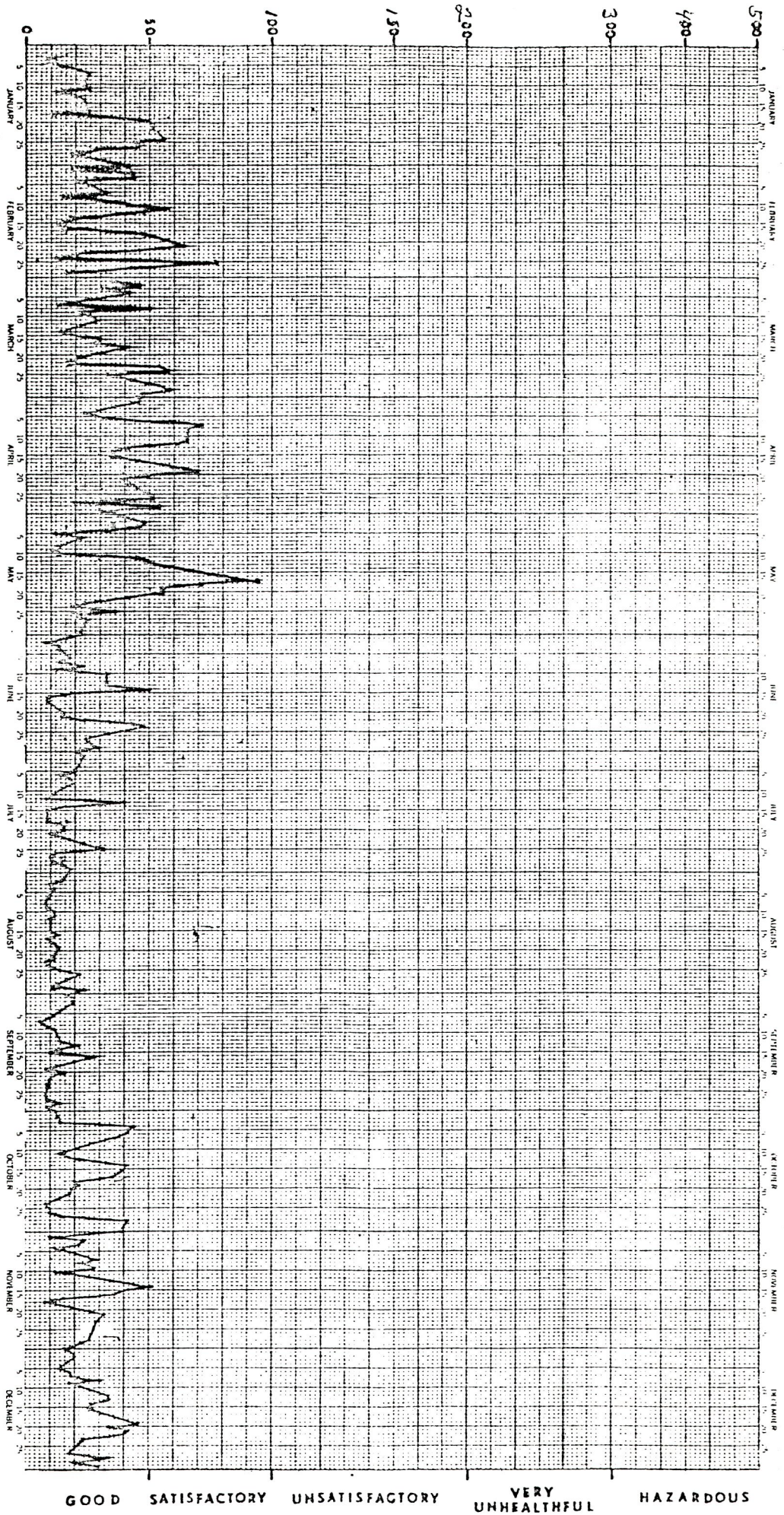
MONTH	DAYS	P.M. VALUES			
	Good	Satisfactory	MAXIMUM	MINIMUM	MEAN
Year	206	46	99	6	34
Jan.	14	6	65	9	36
Feb.	12	8	81	13	45
March	16	7	89	19	42
April	11	10	75	22	50
May	14	7	99	11	46
June	21	1	66	8	29
July	20		50	12	20
Aug.	23		44	9	17
Sept.	21		50	6	25
Oct.	14	7	72	10	39
Nov.	19		49	12	29
Dec.	21		49	18	34
SD.					19

Of the values in the Satisfactory category, T.S.P. values were responsible on two days for both morning and afternoon PSIs. All others in the Satisfactory range were related to Ozone concentrations. No values in the higher ranges.



A.M. POLLUTION STANDARD INDEX  
WEST PALM BEACH, FLA

1977

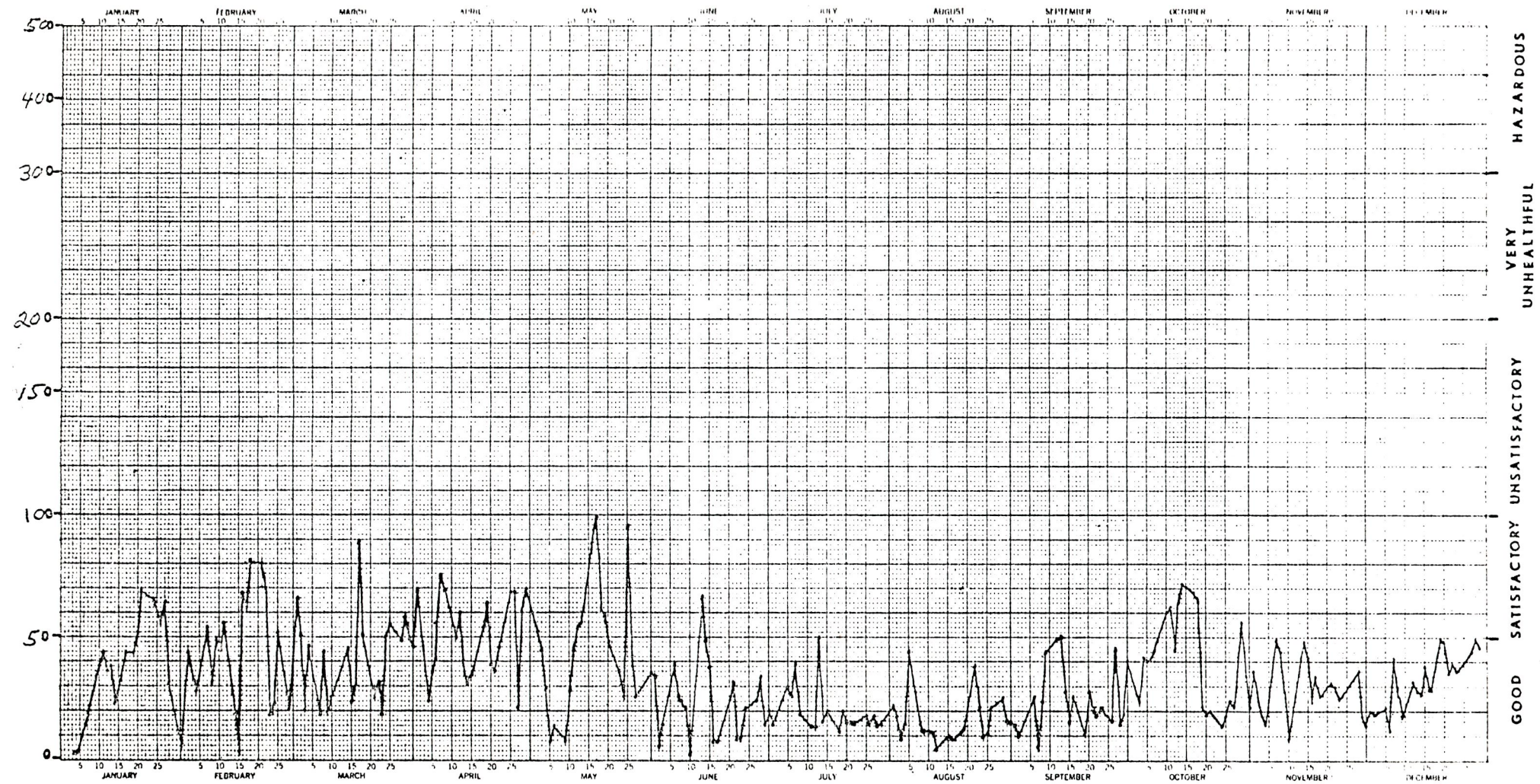


GOOD SATISFACTORY UNSATISFACTORY VERY UNHEALTHFUL HAZARDOUS



P. M. POLLUTION STANDARD INDEX  
WEST PALM BEACH, FLA

1977





## VII EMISSION INVENTORY

### INTRODUCTION

Air Pollution has come about as a by-product of the technological advancement of modern society. In this advancement, society has developed ways to prevent and control atmospheric emissions.

An initial step towards improving the air pollution situation is to define the problem areas by determining the sources and components of air pollution. This is accomplished by the emission inventory, which addresses the source, pollutant types, and quantities of atmospheric emissions.

An emission inventory is an essential tool for an air pollution control program by providing: information for the design of an air sampling and air analysis program; the relative contribution of the various pollution sources; data for the development of control strategies; and information for regional planning authorities.

Limitations in the state-of-the-art knowledge introduce uncertainties in a number of factors, such as reported fuel usage figures, fuel composition, process information, and emission factors which will not produce highly precise information for the emission inventory. In spite of these limiting factors, the emission inventory can yield results with adequate accuracy for the purpose of a county air pollution survey.

The emission inventory presented in this report represents calculated emissions from point sources and generalized estimates of emissions from area sources. Emission factors utilized in the inventory are found in:

- (1) Compilation of Air Pollution Emission Factors, AP-42, Supplements 1-7, Second Edition, April 1977, published by the U.S. Environmental Protection Agency,

Office of Air and Waste Management, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, 27711.

- (2) Guidelines for Air Quality Maintenance Planning and Analysis, Volume 7: Projecting County Emissions, EPA-450/4-74-008, Second Edition, January 1975, U.S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, 27711.
- (3) Letter and attachments from U.S. Environmental Protection Agency, Region IV dated April 9, 1978 to the Palm Beach County Health Department subject: Emission Factors for Florida Sugarcane.
- (4) Population figures were obtained from the Area Planning Board of Palm Beach County, as of April 1977 and reflect a two and one-half (2.5%) percent increase in population.

#### DISCUSSION AND RESULTS

This emission inventory summary (tons/year) includes area and point sources within Palm Beach County. It should be noted that this emission inventory is at best a generalized estimation of typical emissions found within the county. Not every pollution source has been considered for this report.

#### TRANSPORTATION

A decrease in this category can be attributed to automobile pollution control devices even though the numbers of automobiles driven within the county have increased. Increases in both Aircraft and Locomotive emission reflect increase in activities for each classification during this reporting period.

#### INDUSTRIAL

A decrease in this category can be attributed to a reduction in power generation at the Florida Power and Light plant in Riviera Beach; and a change in

methodology in computing emissions for the Industrial Process classification. An increase in Aircraft Industry activity reflects an increase for this source classification's emissions.

#### MINERAL PRODUCTS

A decrease in this category reflect a change in methodology for calculating emission for the Concrete/Cement classification.

#### FOOD AND AGRICULTURE

A reduction in emissions for this category is attributed to a reduced operating season for the sugar industry for the 77-78 season. Field Burning classification reflects a decrease due to a change in the methodology in calculating these emissions. The Environmental Protection Agency changed the fuel loading factor and emission factors to specifically depict Florida Sugarcane conditions.

#### EVAPORATION LOSS

A reduction in this category is attributed to a methodology change in computing petroleum storage emissions.

#### SOLID WASTE

An increase in this category reflects an increase in acreage burned during the reporting period in the Open Burning-Land Clearing classification.

#### DOMESTIC AND COMMERCIAL USAGE

A reduction in emissions for this category reflects better information for sales of fuels within the county during the reporting period.



SUMMARY OF AIR POLLUTION EMISSIONS IN PALM BEACH COUNTY  
1977 (T/YR)

SOURCE	ORGANIC ACIDS	ALD	CO	HC	NO <sub>2</sub>	SO <sub>2</sub>	SO <sub>3</sub>	PART	TOTAL	%
<b>TRANSPORTATION</b>										
Motor Vehicles	96	15	141513	14347	13549	566		1584	171670	57.66
Aircraft			2348	314	274	30		17	2983	1.00
Locomotives	13	11	250	181	711	109		48	1323	0.44
Vessels			3	3	21	103		13	143	0.05
TOTAL	109	26	144114	14845	14555	808		1662	176119	59.15
<b>INDUSTRIAL</b>										
Steam Electric			323	40	10259	4800	61	1335	16818	5.65
Industrial Process			66	13	484	987	14	39	1603	0.54
Aircraft Industry			181	250	1176	185	1	95	1888	0.63
TOTAL			570	303	11919	5972	76	1469	20309	6.82
<b>MINERAL PRODUCTS</b>										
Asphalt Concrete			3	1	26	109	1	34	174	0.06
Concrete/Cement Industry								11	11	0.004
TOTAL			3	1	26	109	1	45	185	0.064
<b>FOOD AND AGRICULTURE</b>										
Sugar Cane Processing			50	10	1413	3154	32	1543	6202	2.08
Sugar Field Burning			56578	11176				5867	73621	24.73
TOTAL			56628	11186	1413	3154	32	7410	79823	26.81
<b>EVAPORATION LOSS</b>										
Solvents				5019					5019	1.69
Petroleum Storage				579					579	0.19
Petroleum Marketing				2558					2558	0.86
TOTAL				8156					8156	2.74
<b>SOLID WASTE DISPOSAL</b>										
Refuse Incineration			63	19	20	16		46	164	0.06
Open Burning-Land Clearing			9423	1615	269			1144	12451	4.18
TOTAL			9486	1634	289	16		1190	12615	4.24
<b>DOMESTIC/COMMERCIAL USAGE</b>										
			42	14	232	224	3	29	544	0.18
TOTAL			42	14	232	224	3	29	544	0.18
<b>TOTAL</b>	<b>109</b>	<b>26</b>	<b>210843</b>	<b>36139</b>	<b>28434</b>	<b>10283</b>	<b>112</b>	<b>11805</b>	<b>297751</b>	<b>100.00</b>

77



